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The Heritage Council



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Clare Heritage Forum



Clare County Council

County Clare Habitat Survey

Survey of Natural Habitats in East County Clare

Survey is an Action under the County Clare Heritage Plan

Habitat Survey Report

December 2008





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Table of Contents

1	Technical Summary.....	1
2	Introduction	4
2.2	Location and Survey Area.....	4
2.3	Objectives of the survey.....	4
2.4	Habitat Mapping	5
2.5	Topography, Geology and Soils.....	5
2.6	Existing Habitat Information	5
3	METHODS	7
3.1	Desk-based Study	7
3.2	Access.....	7
3.3	Constraints	8
4	RESULTS	10
4.1	Introduction.....	10
4.2	Overview	10
4.3	Improved agricultural grassland (GA1).....	12
4.4	Wet grassland (GS4)	12
4.5	Dry calcareous and neutral grassland (GS1)	13
4.6	Dry meadows and grassy verges (GS2)	13
4.7	Scrub (WS1).....	14
4.8	Mixed broadleaved woodland (WD1)	14
4.9	Mixed broadleaved/conifer woodland (WD2).....	14
4.10	Oak-ash-hazel woodland (WN2)	15
4.11	Amenity grassland (GA2).....	15
4.12	Heath (HH1)	15
4.13	Wet willow-alder-ash woodland (WN6)	16
4.14	Reed and large-sedge swamp (FS1)	16
4.15	Dry-humid acid grassland (GS3).....	17
4.16	Bog woodland (WN7).....	17
4.17	Marsh (GM1)	17
4.18	Wet pedunculate oak-ash woodland (WN4)	18
4.19	Tall-herb swamps (FS2).....	19
4.20	Ecological Corridors.....	19



4.21	Summary of Species Rich Habitats and Areas Recommended for Further Survey and Protection	22
4.22	Annex 1 Habitats	26
4.23	Invasive Species.....	26
5	CONCLUSION	27
	References.....	28
	APPENDIX 1	29
	Scope of Works.....	29
	APPENDIX 2.....	34
	Map of survey area with target note numbers of notable areas of habitat.....	34
	APPENDIX 3.....	35
	Target Notes.....	35
	APPENDIX 4.....	46
	Plates of notable areas of habitats recorded during the survey.....	46
	APPENDIX 5.....	76
	Overview of Survey Area.....	76
	APPENDIX 6.....	77
	Fossitt Level 3 Habitat Survey Maps	77

1 Technical Summary

INTRODUCTION

A habitat survey of approximately 65 km² of land within east County Clare was undertaken by Scott Wilson Scotland and Ireland Ltd in 2008. The areas chosen for survey focussed on unbuilt land outside urban areas that was not either already designated for its biodiversity value, and excluded areas of woodland greater than 1 ha in size.

The purpose of the survey was to provide baseline information on the range and extent of semi-natural habitats in this part of County Clare. Specifically the objectives were defined as :

- to survey the habitats within a defined area to detailed Fossitt 3 level;
- to identify all Annex 1 EU Habitats Directive habitats occurring within the survey area
- to identify all areas of biodiversity importance, wildlife corridors and buffer areas
- to calculate the area of all habitats present within the study area.
- to produce a GIS habitat map showing all habitats using the Level 3 Fossitt habitats classifications.

This information will be used to safeguard areas that have ecological value and will assist with the future planning policy and development of this area of County Clare.

How the survey was carried out

Field data were collected over two time periods (10th-17th August 2008 and 23rd-26th September) by teams of field ecologists.

Access to some sections of survey area was restricted due to the following health and safety constraints:

- There was very heavy rain fall during the initial visit and so areas that were naturally wet became even wetter during the survey. Some areas became dangerous to access as ditches became swollen and surface water made some areas unstable to walk on.
- Livestock, particularly bulls and bullocks, meant that some fields couldn't be accessed during the first visit, and; rutting stags on the highest ground within the survey area north-west of Killaloe prohibited access during the second visit.
- There was shooting in some areas which restricted access, although this was a rare occurrence.

Areas not accessed are contained within a separate layer on the GIS habitat map. These habitats were assessed from aerial photographs only and so there are no species lists associated with these habitats.

A modified version of the methods set out in "A Guide to Habitats in Ireland" (Fossitt, 2000) was used. The modifications, which were required as a result of resource availability, included a reduction in the level of detail of species lists that were produced.

Following classification of a habitat in the field, its extent was mapped on aerial photographs and the associated Fossitt code was assigned to it. When a habitat of interest was located notes were taken to describe the habitat and to note the species present. Habitats were also evaluated in terms of their biodiversity importance using assessment criteria of low, medium and high value according to the number and value of species present. Areas that were considered to be of high biodiversity importance were recommended for further study and possible protection.

The data collected during the survey was later transferred to digital mapping format using MapInfo GIS. All habitats were recorded using the Fossitt Level 3 habitat classification and each habitat area was calculated in order to assess its extent within the survey area.

What was found

A total of 34 different habitats were recorded within the agreed survey area. These were improved agricultural grassland, wet grassland, conifer plantation, dry calcareous and neutral grassland, dry meadows and grassy verges, scrub, mixed broadleaved woodland, mixed broadleaved/conifer woodland, oak-ash-hazel woodland, amenity grassland, dense bracken, arable crop, dry siliceous heath, immature woodland, wet willow-alder-ash woodland, reed and large sedge swamp, dry-humid acid grassland, bog woodland, marsh, wet pedunculate oak-ash woodland, recolonising bare ground, active quarries and mines, tall herb swamp, tilled land, flower beds and borders, horticultural land, eutrophic lakes, exposed siliceous rock, earth banks, stone walls and other stone work, eroding/upland rivers, drainage ditches, hedgerows and treelines.

These habitats varied in their species diversity and ecological value. Some of the habitats had suffered from over-grazing, poaching and nutrient enrichment and had therefore lost their original species composition. However, other habitats were found to be relatively unimproved and good examples of species rich habitats were recommended for further survey and protection.

Improved agricultural grassland was the most common habitat type (by area), which is assessed as of low biodiversity value. The dominance of this habitat reflects the high level of agricultural activity within the area. Habitats with a high level of biodiversity value were recorded, however these habitats were often small in size and surrounded by improved grassland, making them fragmented.

Examples of habitats that were of particular note include wet grassland, acid grassland, heath, marsh, semi-natural woodland, swamp and semi-improved and unimproved grassland and are recommended for further investigation and possible protection.



Conclusion

This survey has shown that a large proportion of the eastern area of County Clare is dominated by improved agricultural grassland. However, there were habitats of greater biological value which included wet grassland, marsh and semi-natural broadleaved woodland. In order to preserve these areas, it is recommended that any development is not allowed to reduce the biological value of these areas to ensure that these habitats and ecological corridors are protected or enhanced in order to maintain and improve the level of biodiversity within the county.

2 Introduction

This document describes the results of a habitat survey that has been carried out for selected areas within east Clare County Council.

2.1.1 Background

In October 2008, Scott Wilson Scotland and Ireland Ltd were commissioned by Clare County Council to undertake a Sustainable Marina, Recreational and Tourism Development Strategy study for Lough Derg. As an addition to this study, Scott Wilson was asked to undertake a habitat mapping assessment of areas adjacent to Lough Derg. The objective of this survey was to provide a detailed overview of the habitat types present within the agreed survey area using Level 3 of the Fossitt classification system. The habitat information collected during this survey will be used to provide baseline data on the biodiversity value of habitats within the study area and to identify areas of local biodiversity importance in addition to potential ecological corridors. This information will be used to safeguard areas that have ecological value and will assist with the future planning policy and development of this area of County Clare. A full scope of works can be found in Appendix 1.

2.2 Location and Survey Area

Initially, the habitat survey was to cover a 94 km² area in the eastern section of County Clare. Whilst there was an aspiration to collect data for the whole of this area it was recognised that data already existed for certain areas, and constraints on resources made repetition of these previous surveys unfeasible. Consequently, the survey area was defined as land within the targeted area of County Clare, outwith built-up areas, and excluding land covered by national and international conservation designations (for which data already exists) and excluding areas of woodland over 1 ha in size (surveyed by the National Parks and Wildlife Service (NPWS)). Thus the remaining survey area comprises approximately 65 km² with its southern extent at Killaloe and its northern extent approximately 20 km further north. The eastern boundary of the survey area extends to the town of Scarriff. A map of the survey area is shown in Appendix 2.

2.3 Objectives of the survey

The main objectives of this habitat survey are as follows:

- to survey the habitats within a defined area to detailed Fossitt 3 level;
- to identify all Annex 1 EU Habitats Directive habitats occurring within the survey area
- to identify all areas of biodiversity importance, wildlife corridors and buffer areas
- to calculate the area of all habitats present within the study area.
- to produce a GIS habitat map showing all habitats using the Level 3 Fossitt habitats classifications.

2.4 Habitat Mapping

Habitat mapping can serve many functions. In this context it has been used to help identify habitats of species richness and therefore assists with the protection of vulnerable species and areas, but has also identified areas of lower biodiversity value. By using "The Guide to Habitats in Ireland" (Fossitt, 2000) a standardised approach was used to map the habitats within the study area in order to carry out the identification of different habitats at a general level. The habitat classification system acts to identify natural, semi-natural and artificial habitats within the terrestrial, freshwater and marine environments and of rural and urban areas. The Fossitt classification system operates on three different levels:

Level One classification differentiates between eleven broad habitats groups including freshwater, grassland and marsh, heath and dense bracken, peatlands, woodland and scrub, exposed rock/disturbed ground, cultivated and built land, coastland, littoral, sublittoral and marine water body.

Level Two classification system breaks down the level one classification into further sub-categories and includes 30 habitat sub-groups. For example grassland and marsh can be further broken down into improved grassland, semi-natural grassland and freshwater marsh.

Level Three classification system can be broken down into 117 sub-categories and differentiates the level two classifications further. For example semi-natural grassland can be broken down into dry calcareous and neutral grassland, dry meadows and grassy verges, dry-humid acid grassland and wet grassland.

Habitats within the study area were mapped to Level 3 of the Fossitt Classification system.

2.5 Topography, Geology and Soils

The geology and landform of the Lough Derg basin has been described within the Landscape Character Assessment for County Clare (ERM, 2000).

The geology includes base rich areas of limestone, which occurs from Scarriff Bay up to Portumna. The underlying geology in the south, towards Killaloe, is also neutral - base-rich in character, but is composed of old red sandstone and lower Paleozoic siltstone and shale. The soils associated with these base rocks are variable in character, but comprises mainly gley at the northern shore. Brown earths extend southwards from Scarriff Bay. Areas of brown podzolics and peat occur close to the Lough shore.

2.6 Existing Habitat Information

Some areas within the study area have already been recognised for their biodiversity value or importance and have been protected through designation.

Areas of high biodiversity value are often recognised through designation at the international and national level. At the European level the EC Habitats Directive 1992¹ and The EC Birds Directive 1979² set the context for international designations. The Habitats Directive requires Member States to

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

² Council Directive 79/409/EEC on the conservation of wild birds, commonly referred to as the Birds Directive

protect the 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II (not including birds), by means of a network of sites. Once adopted, these sites are designated by Member States as Special Areas of Conservation (SACs). Special Protection Areas (SPAs), classified under the EC Birds Directive, form a network of protected areas together with SACs known as Natura 2000. Both of these Directives are implemented in Irish Law through the Natural Habitats Regulations, 1997. There are several Natura 2000 sites on or adjacent to Lough Derg and while many of them are not yet formally designated, i.e. proposed (p) SPAs or candidate (c) SACs, they are still subject to full legal protection under these two Directives.

At the national level areas can be designated as a National Heritage Area (NHA), which identifies area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Act (1976) and Wildlife Amendment Act (2000) NHAs are legally protected from damage from the date they are formally designated. To date, 75 raised bogs have been given legal protection, covering some 23,000 hectares have been designated in Ireland, but in addition, there are 630 proposed NHAs (pNHAs), which were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated (<http://www.npws.ie/en/ConservationSites/NaturalHeritageAreasNHAs>) and as such are not subject to legal protection under the Wildlife Act (1976) and Wildlife Amendment act (2000).

Existing designated areas within the study area include:

Lough Derg (Shannon) SPA

Lough Derg is a Special Protection Area (SPA) and is the largest waterbody within County Clare. The shoreline of Lough Derg has also been protected as a result of the occurrence of swamp vegetation along the fringes of the Lough. Aquatic vegetation includes a range of charophyte species, including Red Data Book species, *Chara tomentosa*. The shoreline is often fringed by swamp vegetation, dominated by common reed (*Phragmites australis*), great fen-sedge (*Cladium mariscus*) and bottle sedge (*Carex rostrata*).

Lough Derg provides important habitat for breeding and over-wintering birds and the site supports a nationally important breeding colony of common tern (*Sternus vulgaris*) (www.npws.ie).

Slieve Bernagh Bog Special Area of Conservation (SAC)

Slieve Bog is a candidate SAC located to the west of Lough Derg, in the south-east of County Clare. The site is made up of the Slieve Bernagh mountain range, where the highest peak is Moylussa (532m) and the surrounding habitats include peatlands that flank its northern slopes (www.npws.ie).

Slieve Bernagh Bog has been selected for designation as a result of the presence of blanket bog, wet heath and dry heath. These habitats are listed in Annex 1 of the E.U. Habitats Directive.

3 METHODS

Because of resource constraints, and the existence of habitat data for certain areas, a modified version of the Fossitt Level 3 classification was undertaken. Details of the scope of the works commissioned are presented in Appendix 1. The key areas where the methods employed for this study deviate from a "standard" Fossitt survey are:

- The survey did not attempt to sample areas for which data already existed (e.g. designated sites, woodlands > 1ha). Also, built-up areas were excluded from the survey;
- The survey did not attempt to visit and walk every field and land parcel identified from aerial photographs – site visits were focussed on ground-truthing the aerial photo interpretation, and on visiting areas that appeared to be more botanically diverse;
- Comprehensive species lists were not produced for every field or land parcel.

3.1 Desk-based Study

Preparatory work for the habitat survey involved desk based analysis of the survey area using aerial photographs to identify areas of improved or arable land that were of low biological value and similarly those areas of land that looked more species rich, such as wet grassland and marsh habitat. This information was used to help determine which areas had a high level of species diversity and were therefore given priority during the site visit and those areas that did not require such a thorough survey.

3.2 Access

As a means of organising access prior to carrying out the habitat survey a press release was produced by Scott Wilson Ltd and published in the local newspaper, the Clare Champion. In addition to this, the local chairman of the Irish Farming Association (IFA) was contacted by Scott Wilson Ltd in order to allow details of the survey to be passed on to land owners within the survey area. Once on the ground, where possible, landowners were identified and permission to access land was requested.

Field Survey

Field data were collected over two time periods. Three experienced field ecologists (Nick Dadds, Jenny Sneddon and David Broughton) from Scott Wilson collected data between 10th-17th August 2008. A further visit was made by two ecologists (Jenny Sneddon and Stephen Clark) between 23rd-26th September, meaning that a total of 29 days of field survey were undertaken.

A total area of approximately 65 km² (6500 ha) was sampled (See Figure 1). This excluded land within designated sites, built-up areas, and areas of woodland >1ha in size.

Habitats were classed according to the methodology of "A Guide to Habitats in Ireland" (Fossitt, 2000). A modified version of the Fossitt methodology was used as it was not possible to visit every area of the survey area on the ground due to time constraints and lack of access to some areas. Detailed species lists were therefore not produced for every habitat as this would have been too time

consuming. Instead the DAFOR (Dominant, Abundant, Frequent, Occasional and Rare) scale was used to denote which were the dominant species within each habitat visited. Areas that were not ground-truthed were assessed from aerial photographs.

Following classification of a habitat in the field, its extent was mapped on the aerial photograph and the associated Fossitt code was assigned to it. When a habitat of interest was located a target note was written to describe the habitat and to note the species present (see Appendix 3). In addition, photographs were taken to illustrate any species rich habitats present within the survey area (see Appendix 3).

Analysis

A level of importance was assigned to a habitat with regards to its ecological importance following methodology stated in the Habitat Survey Guidelines (NATURA, 2005). The following table (Table 1) summarises the criteria used to assess a habitat;

Table 1: Table showing classification criteria for habitats within the survey, taken from NATURA (2005)

Classification	Criteria
High Value, locally important	Sites containing semi-natural habitats with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species.
Moderate value, locally important	Sites containing some semi-natural habitat or locally important for wildlife
Low Value, locally important	Artificial or highly modified habitats with low species diversity and low wildlife value.

3.3 Constraints

Access to some sections of survey area was restricted due to the following health and safety constraints:

- There was very heavy rain fall during the initial visit and so areas that were naturally wet became even wetter during the survey. Some areas became dangerous to access as ditches became swollen and surface water made some areas unstable to walk on.
- Livestock, particularly bulls and bullocks, meant that some fields couldn't be accessed during the first visit, and; rutting stags on the highest ground within the survey area north-west of Killaloe prohibited access during the second visit.
- There was shooting in some areas which restricted access, although this was a rare occurrence.



Areas not accessed are contained within a separate layer on the GIS habitat map. These habitats were assessed from aerial photographs only and so there are no species lists associated with these habitats.

4 RESULTS

4.1 Introduction

The habitat classifications and associated target notes have been provided as GIS layers. An overview of the habitats found and the area of each is provided in the next section. Copies of the detailed target notes are included in Appendix 3. Example photographs of the habitats are available in Appendix 4.

4.2 Overview

A total of approximately 65 km² (6500 ha) were surveyed on the ground during the two survey visits to County Clare. The remaining 7.14 km² (714 ha) were assessed using aerial photographs.

Following Fossitt Level 3 habitat surveys within County Clare, a total of 34 habitats were recorded within the agreed survey area. Table 2 shows the habitats recorded, the area of each habitat and the % total of each habitat within the survey area. These habitats varied in their species diversity and ecological value. An overview of the survey area can be found in Appendix 5 and maps showing the results of the Fossitt survey can be found in Appendix 6.

The habitat that was recorded most often within the survey was improved agricultural grassland (GA1). This habitat has a low biodiversity value as it is dominated by perennial rye grass (*Lolium perenne*) with few other species present within the sward. The dominance of this habitat reflects the high level of agricultural activity within the area. Habitats with a high level of biodiversity value were recorded, however these habitats were often fragmented and were of limited size as they were surrounded by improved agricultural grassland or they were closely associated with Lough Derg.

Table 2: Habitat types, according to Fossitt (2000) classification, areas of habitat (ha) and percentage area of total habitat survey area.

Habitat	Code	Area (ha)	% total area
Improved agricultural grassland	GA1	38632.39	60.662
Wet grassland	GS4	6244.99	9.387
Conifer plantation	WD4	5617.67	8.730
Dry calcareous and neutral grassland	GS1	4346.65	6.565
Dry meadows and grassy verges	GS2	1478.06	2.420
Scrub	WS1	1428.46	2.308
Mixed broadleaved woodland	WD1	944.18	1.482
Mixed broadleaved/conifer woodland	WD2	839.53	1.544
Oak-ash-hazel woodland	WN2	744.92	0.980

Habitat	Code	Area (ha)	% total area
Amenity grassland	GA2	691.60	1.085
Dense bracken	HD1	605.19	0.950
Arable crop	BC1	465.11	0.730
Dry siliceous heath	HH1	434.20	0.363
Immature woodland	WS2	396.06	0.622
Wet willow-alder-ash woodland	WN6	395.82	0.561
Reed and large sedge swamp	FS1	287.73	0.431
Dry-humid acid grassland	GS3	150.26	0.275
Bog woodland	WN7	134.99	0.212
Marsh	GM1	101.19	0.147
Wet pedunculate oak-ash woodland	WN4	95.45	0.131
Recolonising bare ground	ED3	71.93	0.113
Active quarries and mines	ED4	33.06	0.052
Tall herb swamp	FS2	9.16	0.014
Tilled land	BC3	4.98	0.008
Flower beds and borders	BC4	3.87	0.006
Horticultural land	BC2	2.94	0.005
Eutrophic lakes	FL5	2.87	0.005
Exposed siliceous rock	ER1	1.79	0.003
Earth banks	BL2	1.00	0.002

Habitats where it was not possible to survey were mapped using the GIS datasets and aerial photographs. These habitats and their areas are shown in Table 3.

Table 3: Habitats types mapped using aerial photographs and areas (ha) of habitat mapped.

Habitat	Code	Area (ha)
Improved agricultural grassland	GA1	323.38
Wet grassland	GS4	214.95
Dry siliceous heath	HH1	68.70
Dry calcareous and neutral grassland	GS1	46.21
Scrub	WS1	37.02
Amenity grassland (improved)	GA2	17.31
(Mixed) broadleaved woodland	WD1	4.12
Arable crops	BC1	2.02

Field boundaries and waterways were also recorded during the surveys. These included stone walls, rivers and ditches, hedgerows and treelines. These features were not recorded in any great detail, only their presence was recorded in order to calculate the length of these features within the survey area. Table 4 shows the length of these features recorded within the survey area.

Table 4: Length (m) of treelines, hedgerows, ditches, rivers and stone walls recorded. This table includes habitats mapped during the survey and habitats mapped using aerial photographs.

Habitat	Fossitt Level 3 Code	Length (m)
Stone walls and other stonework	BL1	745
Eroding/upland rivers	FW1	14756
Drainage ditches	FW4	10406
Hedgerows	WL1	508429
Treelines	WL2	104939

These features are an important component of maintaining biodiversity within any habitat. Especially when an area is dominated by improved agricultural grassland which provides low ecological value as these features act as corridors for wildlife that can utilise them to move between habitats, can provide feeding and breeding habitat and can act as refuges.

The following section provides an overview of the habitats encountered during the habitat survey. A description of the distribution of each habitat is provided along with the plant species present and any habitats of species richness are highlighted.

4.3 Improved agricultural grassland (GA1)

Improved grassland utilised for agricultural purposes was the most abundant habitat within the survey area. This habitat is dominated by the presence of perennial rye grass (*Lolium perenne*). Other species commonly present include meadow grass (*Poa pratensis*), Yorkshire fog (*Holcus lanatus*) and crested dog's tail (*Cynosurus cristatus*).

Often present within improved grassland habitat are areas of species poor wet grassland, which can be identified by the presence of soft rush (*Juncus effusus*). This habitat is often subjected to a high level of cattle grazing and/or silage production and as a result is low in ecological value.

Improved grassland often forms large blocks of habitat. An example of one such area is an (82 ha) area of improved grassland in Boleynagoagh IR 74222 87127.

4.4 Wet grassland (GS4)

Wet grassland is similar in species composition to marsh with wet grassland containing more grass and sedge species. Wet grassland can be found on flat or sloping ground in upland and lowland areas. The species composition of wet grassland varies significantly but often contains abundant rushes (*Juncus effusus*, *Juncus acutiflorus* and *Juncus articulatus*) in addition to sedges (*Carex flacca* and *C. hirta*). The grass species present include Yorkshire fog, creeping bent, marsh foxtail, and tufted hair grass. Broadleaved herbs are also found within wet grassland and include creeping buttercup, silverweed, water mint, meadowsweet, marsh thistle, lesser spearwort and devil's bit scabious.

Wet grassland is a common habitat throughout the survey area, and it is most often associated with poorly-drained areas close to waterbodies and low lying ground that is prone to flooding. The approximate area of wet grassland within the survey area is 624.50 ha. The wet grassland habitat

within the survey area varies in species richness with some areas being relatively unimproved. Those areas of wet grassland directly associated with agricultural areas have been depleted in their species richness as a result of intense grazing and enrichment due to fertilizer use. However, wet grassland areas that have not had their species composition altered as a result of these practices have a much richer species composition which includes: soft rush (*Juncus effusus*), hard rush (*Juncus inflexus*), jointed rush (*Juncus articularis*), sedge species (*Carex* sp.), purple loosestrife, meadowsweet, marsh thistle, lesser spearwort, black knapweed, yellow iris and orchid species.

Areas of semi-improved or unimproved wet grassland are described in the target notes in Appendix 3. Examples of wet grassland encountered during the survey include an extensive area approximately 23 ha located in Bargarriff at grid reference IR 76083 89929. This large area of species rich wet grassland contained abundant *Juncus* spp. silverweed, black knapweed and meadowsweet. Grass species present include false-oat grass, Yorkshire fog and sweet vernal grass.

4.5 Dry calcareous and neutral grassland (GS1)

This Fossitt classification describes these grasslands as unimproved or semi-improved dry grassland that may be either calcareous or neutral, but not acid (Fossitt, 2000).

Dry calcareous and neutral grassland can be identified by the presence of a wide range of grasses and broadleaved herbs. The occurrence of these species can be as high as 45 species m⁻². Grasses present commonly include bents (*Agrostis* sp), meadow grass (*Poa* spp.) sweet vernal grass (*Anthoxanthum odoratum*), crested dog's tail (*Cynosaurus cristatus*), cock's foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*). Common broadleaved herbs include yarrow (*Achillea millefolium*), common knapweed (*Centaurea nigra*), self heal (*Prunella vulgaris*) and bird's foot trefoil (*Lotus corniculatus*).

Species rich dry calcareous and neutral grassland is rare within the study area. There is a total of approximately 434.36 ha within the study area, however, this is often subject to grazing and so has lost its floristic diversity. However, some areas of grassland that are not subject to grazing or enrichment have retained their floristic value. An example of one such meadow is located at Ballynakillew IR 7483 8696 at the edge of Lough Derg. This small meadow contains orchid species along with grass species such as bent species, frequent sweet-vernal grass (*Anthoxanthum odoratum*) and occasional quaking grass (*Briza media*). There is also jointed rush, red clover (*Trifolium pratense*), greater-bird's foot trefoil, common knapweed (*Centaurea nigra*), glaucous sedge (*Carex flacca*) and devil's bit scabious (*Succisa pratensis*). Another example of semi-improved neutral grassland includes a meadow that is assessed as being occasionally grazed but still possessed a relatively species-rich composition. Bent species were the dominant grass, but there was also abundant red fescue (*Festuca rubra*). Yarrow (*Achillea millefolium*), autumnal hawkbit (*Leontodon autumnalis*), red clover and ribwort plantain (*Plantago lanceolata*) are all frequent to abundant.

4.6 Dry meadows and grassy verges (GS2)

Dry meadows and grassy verges are characterised by the presence of a high proportion of tall, coarse and tussock forming grasses such as false oat grass (*Arrhenathrum elatius*) and cock's foot (*Dactylis glomerata*). Broadleaved herbs that are present include hogweed (*Heracleum sphondylium*), cow

parsely (*Anthriscus sylvestris*), bush vetch (*Vicia sepium*) and common knapweed (*Centaurea nigra*). These grasslands are rare within Ireland as a result of a change in land management that means that dry meadows that are rarely fertilised or grazed are rare.

Dry meadows and grassy verges comprise approximately 147.81 ha of the survey area. However, as with GS1, examples of unimproved meadows are rare. An example of a semi-improved meadow is located at Cappaduff IR 69797 86569 and is dominated by bent grass, with red fescue and sweet vernal grass. Herbs present include ribwort plantain, white clover (*Trifolium repens*), autumnal hawkbit, common knapweed and red clover. Another area of relatively unimproved dry meadow is located in Whitegate at IR 75034 89279. Abundant grasses include false oat grass (*Arrhenathrum elatius*), cock's foot (*Dactylis glomerata*) and red fescue. Herbs present include yarrow, bird's foot trefoil, tufted vetch (*Vicia cracca*), ribwort plantain, common mouse ear (*Cerastium fontanum*) and vetch species (*Vicia* sp.).

4.7 Scrub (WS1)

Scrub habitat includes areas dominated by at least 50% of shrubs, stunted trees and brambles Fossitt (2000) where the canopy height is less than 5 m. Species characteristic of scrub habitat include gorse (*Ulex europaeus*), blackthorn (*Prunus spinosa*), willow (*Salix* spp) and bog myrtle (*Myrica gale*).

A total of 142.85 ha of scrub was recorded within the survey area. The main species recorded included gorse (*Ulex europaeus*) and willow (*Salix* spp.).

An example of scrub is in Ballylaghnan at IR 67647 80185 where there is an extensive area of gorse.

4.8 Mixed broadleaved woodland (WD1)

Mixed broadleaved woodland was used to classify broadleaved plantation where the conifer component was 25% or less cover within the woodland. There is approximately 93 ha of this habitat within the survey area. Although WD1 is a modified habitat and it lacks the ground flora and structure of naturally occurring broadleaved woodlands, it still serves as important refuge and wildlife corridors for birds, insects and mammals. Species that were dominant within this habitat type included ash, sycamore, beech and birch.

An example of mixed broadleaved and conifer woodland habitat is found in Aughnish at IR 70990 81517.

4.9 Mixed broadleaved/conifer woodland (WD2)

Fossitt categorises this woodland habitat as areas with mixed stands of broadleaved trees and conifers where both types have a minimum cover of 25% and a maximum cover of 75% (Fossitt, 2000).

Mixed broadleaved woodland comprises approximately 84 ha of the survey area. There are several large areas of this habitat including a large area located at Aughinish Point at Lough Derg.

4.10 Oak-ash-hazel woodland (WN2)

Oak-ash-hazel woodland is defined by Fossitt (2000) as native, semi-natural woodland that occurs on base-rich or calcareous soils that are dry or well-drained. Species that dominate this woodland habitat include pedunculate oak, ash or hazel. Ground flora indicative of this woodland includes ivy, wood anemone, bluebell, wood avens, sanicle and ramsons.

There are limited areas of this type of woodland within the survey area. Remnants of WN2 can be found in narrow strips along the sides of riverbanks. There is approximately 74.5 ha of this habitat within the survey area. Other species associated with this woodland include holly (*Ilex aquifolium*) and blackthorn (*Prunus spinosa*) which make up the understorey and there is often a species rich ground flora associated with this woodland, including: ivy (*Hedera helix*), herb Robert (*Geranium robertium*), remote sedge (*Carex remota*), fern species, sanicle (*Sanicula europaea*) and wood sorrel (*Oxalis acetosella*).

4.11 Amenity grassland (GA2)

Amenity grassland has a similar species composition to that of improved agricultural grassland with perennial rye grass often being the dominant species. However, the land use for amenity grassland includes rugby pitches and parks. The highest proportion of amenity grassland is located within the urban area of Killaloe and its associated areas. Amenity grassland's role is predominantly of social value and it has limited wildlife conservation value. The total area of amenity grassland recorded within the survey area was 69 ha.

An example of amenity grassland within the survey area is a golf course located in Woodpark at IR 68909 86297.

4.12 Heath (HH1)

Heathland is characterised by open vegetation and where there is at least 25% cover of dwarf shrubs. Trees and shrubs may be present but they should not dominate the habitat.

Dry siliceous heath can be found on flat to steeply sloping ground in upland and lowland areas (Fossitt, 2000). Species that characterise this habitat include ling (*Calluna vulgaris*), bell heather (*Erica cinerea*) and bilberry (*Vaccinium myrtillus*). Western Gorse (*Ulex gallii*) may also be present but it must be low-growing.

The total area of dry siliceous heath recorded within the survey area was approximately 43 ha. There are several areas of heath habitat within the survey area. A large area of approximately 13 ha was located at Caher Mountain in Carrowena at IR 67725 80651. Another significant area of heathland of approximately 20 ha is located in the very north of the survey area, just outside of the boundary of the NHA that encompasses Lough Leamhnachta at grid reference IR 75648 90445. It was not possible to access this area due to a deep ditch and dense conifer plantation surrounding this area. However, it was surveyed from a distance and it was evident that there was a mosaic of habitats within this area; including willow scrub, bracken and grass species. Another area of heathland of approximately 7.2 ha was recorded near Carnagnoe Valley in Carrowbaun at IR 65214 77965. Common heathland species recorded included ling. This area of heath is also associated with dry acid grassland.

4.13 Wet willow-alder-ash woodland (WN6)

Wet willow-ash woodland is characterised by being permanently waterlogged and is dominated by willows, alder or ash, or a mix of these species within the canopy.

Wet woodland occurs throughout the survey area and can be found associated with the shores of Lough Derg and on wetter areas within the survey area. A total of 40 ha of WN6 was recorded within the survey area. The canopy was often found to be a mix of willow, alder and ash and was generally low in height, between 6 and 10 metres. The ground flora associated with wet woodland is composed of species found in wetter habitats as these woodlands have permanently wet soils. Species commonly found during the survey include purple loosestrife, yellow iris, meadow sweet and wood horsetail (*Equisetum sylvaticum*).

Descriptions of the wet woodland recorded during the habitat survey are shown in the target notes in Appendix 3. However, an example of an area of wet woodland encountered is of a wet woodland dominated by grey willow and downy birch. This woodland was very wet beneath, including species such as iris and water horsetail and is located in the townland of Ballybroghan at IR 71910 86637.

4.14 Reed and large-sedge swamp (FS1)

Swamp is defined by Fossitt (2000) as stands of emergent herbaceous vegetation that generally occur within the transition zone from open water to terrestrial habitats. Swamp habitat is commonly found along the margins of rivers, lakes, canals, lagoons and estuaries but can also be found within extensive flooded areas. Reed and large-sedge swamp is categorised by Fossitt (2000) as a species poor stand of herbaceous vegetation and is dominated by reeds and other large grasses or large, tussock forming sedges. Species commonly present within this habitat include common reed (*Phragmites australis*), common club rush (*Schoenoplectus lacustris*) and water horsetail (*Equisetum fluviatile*).

Swamp is classed as a threatened habitat in Clare and is listed as an important habitat within the Clare Biodiversity Action Plan.

Approximately 28.77 ha of this habitat was recorded within the survey area. It is commonly found associated with the edge of Lough Derg and wet areas within the survey area. An area of 15.98 ha of reed and large sedge swamp was located on the south side of Scarriff Bay in Bealkelly at IR 6678 8314. Although this area could not be entered due to flooding and dense vegetation, it was surveyed from a distance and classed as swamp dominated by common reed (*Phragmites australis*). Another area of 7.15 ha of swamp is located south of the R352, in Knockaphort at IR 6976 8630. This area of swamp is dominated by rushes (*Juncus* spp.) with locally dominant common reed. There are also herb species present including meadowsweet (*Filipendula ulmaria*), angelica (*Angelica sylvestris*), mint (*Mentha aquatica*), yellow iris (*Iris pseudacorus*) and purple loosestrife (*Lythrum salicaria*). There is also alder (*Alnus glutinosa*) regeneration throughout this swamp area in addition to scattered willow (*Salix* sp.).

A species rich area of swamp was identified along the shores of Lough Derg in Caher at grid reference IR 67922 82900. This area of approximately 2.52 ha is dominated by *Phragmites* but also has locally abundant meadowsweet and occasional purple loosestrife.

There are smaller fragments of swamp habitat that were identified as being ecologically important. An area of swamp in Lackabranter at grid reference IR 67999 77335, approximately 0.44 ha, located just outside of the designated area of Lough Derg was dominated by common reed and grey willow. There is also a small section of marsh dominated by meadow sweet, with yellow iris and greater bird foot's trefoil (*Lotus pedunculatus*) associated with this habitat.

Another species rich area of swamp identified along Lough Derg shore is located in Mountshannon at IR 70657 86804. This area is 0.47 ha in size and is dominated by water horsetail (*Equisetum fluviatile*) and yellow iris. Other species present include meadowsweet and there is a small amount of grey willow scrub.

4.15 Dry-humid acid grassland (GS3)

Fossitt (2000) describes this habitat as unimproved or semi-improved grassland that occurs on free-draining acid soils that are not waterlogged. Species commonly found in this grassland include bents, fescues, sweet vernal grass, wavy hair grass and mat grass. Broadleaved herbs present include heath bedstraw, tormentil and sheep sorrel (*Rumex acetosella*).

Approximately 15 ha of acid grassland were recorded within the survey area with the only extensive area of true acid grassland encountered within the survey area located on the northern slopes of Moylussa hill in Carrowbaun at grid reference IR 65322 77887. The predominant grass species include common bent, sweet-vernal grass and sheep's fescue (*Festuca ovina*). Herbs include occasional heath bedstraw (*Galium saxatile*) and tormentil (*Potentilla erecta*). There is scattered ling, bracken (*Pteridium aquilinum*) and scrub (including gorse, *Ulex europaeus*, hawthorn, *Crataegus monogyna*, and birch, *Betula* sp). The grassland is subject to cattle grazing in many places.

4.16 Bog woodland (WN7)

Bog woodland can be identified by the presence of downy birch (*Betula pubescens*) dominating the canopy. Other trees and shrubs can include holly, rowan, oak and willows. This habitat was recorded on several occasions and comprised 14 ha of the study area.

An example of bog woodland was recorded in Magnoe at IR 66556 85838. This area of woodland was 7.7 ha in size and was dominated by downy birch, but with occasional to abundant grey willow and ash. This woodland was only surveyed from the periphery because large and very deep ditches ran close to the edge and were deemed too dangerous to cross, and along the eastern edge the vegetation was very dense. The ground flora that could be seen was often dominated by bramble, but purple moor-grass was frequent in places and sometimes dominant. Ferns were frequent including hard fern and broad buckler-fern.

4.17 Marsh (GM1)

Marsh habitat is defined within Fossitt (2000) classification as a species-rich habitat that is found on level ground near river-banks, lakeshores and in other places where mineral or shallow peaty soils are waterlogged and where the water table remains close to the surface. Characteristic species found in marsh habitat include rushes (*Juncus* spp.), sedges (*Carex* spp.) and meadowsweet (*Filipendula ulmaria*). Grasses such as creeping bent (*Agrostis stolonifera*), tall fescue (*Festuca arundinacea*) and

purple moor grass (*Molinia caerulea*) may be present but not abundant. Broad leaved herbs present within marsh can include water mint (*Mentha aquatica*), marsh thistle (*Cirsium palustre*), marsh pennywort (*Hydrocotyle vulgaris*) and ragged robin (*Lychnis flos-cuculi*). Marsh habitat is a rare habitat within the survey area and comprises approximately 10.11 ha of the survey area. It is commonly found in association with wet grassland and wet woodland habitats within the survey area in waterlogged areas that have not been improved by agricultural practices. Marsh habitat is a species rich habitat and species commonly found include: *Juncus* sp, creeping bent (*Agrostis stolonifera*), marsh thistle (*Cirsium palustre*), lesser spearwort (*Ranunculus flammula*), water mint, silverweed (*Potentilla anserina*), ragged robin (*Lychnis flos-cuculi*), greater bird's foot trefoil, marsh pennywort (*Hydrocotyle vulgaris*), marsh bedstraw (*Galium palustre*), fool's water cress (*Apium nodiflorum*), yellow iris and unbranched bur-reed (*Sparganium emersum*).

A large field, of 3.87 ha, that was classified as marsh habitat is located at the southern end of the habitat survey area and is in close proximity to the shores of Lough Derg in Cloonfadda (IR 68232 70343). This field is a species rich area of marsh and some of the species present include soft rush, meadowsweet, marsh thistle, ragged robin, marsh bedstraw and marsh pennywort.

Another area of marsh was recorded in Carrowcore at IR 70258 81019. This area of marsh was also associated with wet woodland and species rich wet grassland. The area of marsh at this site was approximately 0.72 ha in size and was dominated by soft rush and sharp-flowered rush and meadow sweet.

An area (1.01 ha) of marsh was recorded in Islandcosgry at IR 69196 79916. This small fragment of marsh contained species such as fool's watercress, iris and hemlock water-dropwort.

Another notable area of marsh was recorded in Meenross at IR 66829 85684. Again, this is a small fragment of marsh, only 0.95 ha in size, however is dominated by meadowsweet, but also has abundant purple loosestrife. This area of marsh is fenced off and so is protected from grazing.

It is recommended that all areas of marsh are protected as far as is possible as these habitats are classed as threatened on the Clare biodiversity plan and they contain a diversity of wetland plants that in turn provide important habitat for invertebrates and other wildlife.

4.18 Wet pedunculate oak-ash woodland (WN4)

Fossitt (2000) defines this woodland as being associated with areas that are flooded or water-logged during winter, but which dry out during the summer months. This woodland is dominated by pedunculate oak and/or ash. The understorey is often composed of hazel, hawthorn, holly and willows. The ground flora is usually composed of meadowsweet, primrose, enchanter's nightshade, ivy, bramble and remote sedge.

Wet pedunculate oak-ash woodland forms approximately 9.5 ha of the survey area. Oak and ash are often dominant in this classification of woodland. Other common species that occur in the canopy include hazel (*Corylus avellana*), hawthorn and holly. Alder (*Alnus glutinosa*) and birch were also recorded within these woodlands. Common components found within the ground flora include herb Robert, ground ivy, remote sedge and meadowsweet. This example of species rich woodland was a rare habitat within the survey area (making up approximately 0.15% of the survey area) and has no doubt declined as a result of drainage and deforestation in the area and should be considered as an important habitat within the survey area.

An example of wet oak-ash woodland, located in the townland of Dooros at IR 71910 86637, encountered during the survey is a woodland that was dominated by oak and birch but with additional abundant species including alder and ash. The ground flora was composed of herb Robert, ground ivy, remote sedge and fern spp. There was also frequent moss spp. within the woodland.

4.19 Tall-herb swamps (FS2)

Tall herb swamp is defined by Fossitt (2000) as a relatively species-rich habitat of herbaceous vegetation that occurs in wet areas where the water table is above ground level for the majority of the year. Examples of species that characterise this habitat include water-parsnip (*Berula erecta*), fool's water cress (*Apium nodiflorum*), hemlock water dropwort (*Oenanthe crocata*) and hemp agrimony (*Eupatorium cannabinum*).

The total area of tall-herb swamp recorded within the survey area was 0.92 ha. Therefore tall herb swamp is regarded as a rare habitat with only a small number of fragments of this habitat within the survey area. One such area is located near Carrowgar in Carrowcore at grid reference IR 69836 80567. The main species within this habitat include abundant meadowsweet, marsh willowherb (*Epilobium palustre*), large bird's-foot trefoil (*Lotus pedunculatus*), yellow iris and frequent *Carex* species. There is also scattered willow within this area.

4.20 Ecological Corridors

Areas of semi-natural woodland that were surveyed comprise of approximately 1200.95 ha of the survey area making 1.88% of the total survey area. The occurrence of this habitat as thin strips of woodland along streams that is surrounded by improved grassland and alongside species poor habitat such as conifer plantation make it a valuable ecological resource as it provides foraging and breeding habitat for a variety of fauna. The table below shows the location of these woodlands and gives a brief description of their species composition.

Table 5: Ecological corridors identified within the survey area.

Habitat Type	Area (Ha)	Grid Reference and Townland	Reference on Map	Habitat Description
Wet willow-alder-ash woodland WN6	1.28	IR 69508 79620	1	Wet woodland dominated by grey willow and ash, next to marshy grassland, with adjacent strip of drier woodland dominated by ash, beech and oak. The wet woodland has purple moor-grass and iris in the ground flora, and grades into the marshy grassland with some scattered willow, where the principle species are purple moor-grass, tufted hair-grass and iris. The drier woodland strip, along a small stream, has a
Oak-ash-hazel woodland WN2	0.64	Islandcosgry, O'Gonnelloe		

Habitat Type	Area (Ha)	Grid Reference and Townland	Reference on Map	Habitat Description
				ground flora principally of ferns (including hard fern and dryopterid ferns), false brome, bramble, honeysuckle and cocksfoot. There is oak-ash-hazel woodland adjacent to this area of wet woodland. This section of woodland is dominated by ash, beech and oak.
Oak-ash-hazel woodland WN2	1.43	IR 67191 86369 Meenross, Scarriff	2	Narrow strip of woodland along river, dominated by ash and sycamore, with frequent hazel, grey willow and hawthorn. Bramble is dominant beneath, with frequent ferns. Invasive Japanese knotweed is locally dominant and should not be disturbed, to avoid further spread.
Oak-ash-hazel woodland WN2	2.15	IR 66609 87030 Middleline North, Inishcaltra North	3	Narrow strip of ash-dominated woodland along small river, with frequent sycamore and hazel. There is regeneration of ash and sycamore. Bramble and ivy are abundant beneath, along with frequent ferns (including hard fern and dryopterid ferns). Opposite-leaved golden-saxifrage is locally abundant in damp patches. Great woodrush is locally frequent.
Oak-ash-hazel woodland WN2	2.75	IR 67048 78936 Ballylaghnan, O'Gonnelloe	4	Narrow strip of woodland along stream, dominated by ash, willow and hazel, but including other trees such as beech and sycamore. There is a reasonable ground flora including species such as sanicle, wood sorrel, remote sedge, hard fern, dryopterid ferns and bramble.
Oak-ash-hazel woodland WN2	4.98	IR 65736 77641 Carrowbaun, Carrowbaun	5	Strip of broadleaved woodland surrounding conifer plantation that has ash, birch and willow.
Oak-ash-hazel	5.55	IR 69121 71764	6	Woodland along banks of small

Habitat Type	Area (Ha)	Grid Reference and Townland	Reference on Map	Habitat Description
woodland WN2		Killestry, Killaloe		river with ash/hazel/sycamore/willow. Ferns abundant including male fern, broad buckler-fern and hart's-tongue fern. Ivy and bramble abundant. Enchanter's nightshade occasional.
Wet willow-alder-ash woodland WN6 Oak-ash-hazel woodland WN2	6.40	IR 66156 77269 Carrownakilly, Carrowbaun	7	Wet woodland dominated by alder. Alder is regenerating in the understorey. Bramble and creeping soft-grass are abundant beneath. Less frequent species include marsh thistle, ferns and devil's-bit scabious. Yellow pimpernel is rare. The woodland block to the north is semi-mature coniferous plantation This wet woodland joins with semi-natural broadleaved woodland that continues along a stream, with a mix of ash, sycamore, alder and willow. Bramble and meadowsweet are abundant beneath. Frequent associates include hard fern, dryopterid ferns and enchanter's-nightshade.
Oak-ash-hazel woodland WN2	3.25	IR 67918 73364 Gortmagy, Lackareagh	8	Narrow strip of woodland along small river dominated by ash and willow with occasional hawthorn. Typical ground flora including bramble, ivy, ferns and enchanter's nightshade.
Oak-ash-hazel woodland WN2	3.92	IR 67695 76660 Ballycuggaran, Carrowbaun	9	Thin strip of woodland along stream which includes native and non-native species, but has a reasonable ground flora so classed as semi-natural. Dominant trees are ash, beech and sycamore, with birch higher up. Frequent ferns (including hard fern, hart's-tongue fern and dryopterid ferns) and ivy, and occasional enchanter's nightshade and honeysuckle. Adjacent strip on south side is grazed modified non-native

Habitat Type	Area (Ha)	Grid Reference and Townland	Reference on Map	Habitat Description
				woodland with much beech.
Wet pedunculate oak-ash woodland WN4	0.86	IR 77686 88027 Drummaan East, Drummaan	10	This area of wet pedunculate oak-ash woodland has abundant ash and alder and frequent hazel. Willow is dominant. The ground flora consists of frequent reed, gorse, meadowsweet, bramble and hedge bindweed. There is occasional false brome, angelica, valerian, field rose, yellow iris and guelder rose. Spindle is also present within this woodland, but it is rare.
Mixed Broadleaved woodland	7.13	IR 67288 74457 Gortmagy, Lackareagh	11	This woodland follows a stream and has a dense canopy of ash, beech, hawthorn, elder, willow.
Wet pedunculate oak-ash woodland WN4	4.83	IR 66239 83075 Raheen, Scarriff	12	Wet pedunculate oak-ash woodland. Ash and sycamore are abundant and there is occasional pedunculate oak. In the understorey there is abundant hazel, frequent silver birch and occasional holly. Ground ivy and ferns are abundant and remote sedge and brambles are occasional and there is frequent nettle.

4.21 Summary of Species Rich Habitats and Areas Recommended for Further Survey and Protection

Areas of species rich habitat were identified during the survey and were recorded as semi-improved or unimproved. All of these habitats are regarded as being of high biological value as they are examples of semi improved or unimproved habitats. It is recommended that further surveys are carried out on these areas and that they are given protection against development. These areas are summarised in the table below;

Table 6: Summary of species rich habitats and areas of interest regarded as having high biodiversity value.

Habitat	Target Note	Grid Reference and Townland	Area (ha)	Reference on Map	Description
GS4 WN7 FS1 GM1	39-42	IR 66579 85942	9.22	1	This mosaic of habitat contains high quality, species rich wet grassland, bog woodland, possible

Habitat	Target Note	Grid Reference and Townland	Area (ha)	Reference on Map	Description
		Meenross, Scarriff			reed swamp and species rich marsh. Access was made difficult to these areas because of flooding however, and it is recommended that further surveys are carried out on these areas.
WN6	27	IR 67326 78086 Ballybroghan, O' Gonnelloe	2.97	2	Access to this woodland was prevented because it was very wet, however, from the periphery it was evident that this was a species rich fragment of wet woodland as there were iris and water horsetails within the ground flora and the canopy was dominated by grey willow and downy birch.
WN6 WN2 GS4 GM1	31 32 88	IR 69596 79475 Islandcosgry, O'Gonnelloe	4.87	3	These species rich areas of wet woodland, oak-ash-hazel woodland, wet grassland and marsh forms an interesting mosaic of habitats that is recommended to receive some protection.
FS1 GS4 GS2		IR 67868 82973 Caher, O'Gonnelloe	7.49	4	A mosaic of interesting habitats in close proximity to Lough Derg shore. This includes an area of unimproved meadow, swamp and wet grassland. It is recommended that these habitats undergo some level of protection.
GS4 WN6	22	IR 67748 77082 Ballycuggaran, Carrowbaun	1.46	5	This area of wet grassland and wet woodland has been fenced of. It contains species rich composition and should receive some protection.
FS1 GM1 WN6	23				This mosaic of swamp, marsh and wet woodland is recommended for protection
WN6	19	IR 66113 76696 Carrownakilly, Carrowbaun	1.06	6	This large area of alder dominant wet woodland has a species rich ground flora. It merges with a large area of semi-natural broadleaved woodland.

Habitat	Target Note	Grid Reference and Townland	Area (ha)	Reference on Map	Description
WN7	57	IR 70497 86377	0.75	7	These habitats occur within close proximity to Lough Derg shore. It is recommended that they are protected from surrounding development as they are examples of species rich habitats that provide a valuable resource for local wildlife populations.
FS1 GS4 WS1	58	Cappaduff, Inishcaltra North IR 70652 86810 Mountshannon, Inishcaltra North	2.26	8	
WN7 FS1 GS2 WN2	53 54 55	IR 69617 86180 Knockaphort, Inishcaltra North	12.36	9	These mosaics of habitats occur along the shore of Lough Derg outwith the designated area.
WN2	52	IR 69117 85854 Knockaphort, Inishcaltra North	0.36	10	This semi-natural woodland may be of interest and it is recommended that further surveys are carried out here.
GS3 HH1	28	IR 65296 77892 Carrowbaun, Carrowbaun	10.97	11	This is an extensive area of acid grassland and heath habitat. Given the low level of occurrence of this habitat within the survey area it is recommended that this area undergoes further investigation and possible protection.
GS4 WN4 WN6	63 64 65	IR 71920 86591 Dooros, Inishcaltra North	4.08	12	Mosaic of species rich grassland and wet woodland along the Lough Derg shore.
GM1 GS4	34 35	IR 70314 80992 Carrowcore,	2.03	13	Area of species rich marsh and wet grassland separated by wet woodland. It is recommended that further surveys are carried out on

Habitat	Target Note	Grid Reference and Townland	Area (ha)	Reference on Map	Description
		Inishcaltra North			this area.
GS4 HH1	81 82	IR 75891 90148 Bargarriff, Drummaan	33.57	14	This is an extensive area of species rich wet grassland surrounding an area of heath. Due flooding it was not possible to survey this area thoroughly and therefore further surveys are recommended.
FL2 GS4 WN6	95	IR 74260 89172 Cregg, Drummaan	37.90	15	The vegetation surrounding this oligotrophic lake species rich and includes sedges and rushes.
GS4	97	IR 75097 88256 Gweeneeny, Mountshannon	1.44	16	It is recommended that this area of semi-improved wet grassland should undergo a full survey and possible protection.
FS1	40	IR 66607 85918 Moynoe	1.29		This area could not be accessed owing to large ditches deemed too dangerous to cross around the surrounding woodland, combined with very dense vegetation along the eastern edge of the woodland. Judging from the aerial photograph and the nature of the surrounding woodland (with birch and willow) this area is likely to be swamp, possibly with willow carr. On the aerial photograph it is similar in colour to areas elsewhere dominated by common reed, suggesting common reed is also present here. Further investigation in this area is recommended.
GS4	99	IR 75824 88073 Cloonmohaum	2.03		Access to this area was difficult, but it is of potential interest. Further survey work is recommended. Frequent meadowsweet and occasional cross leaved heath, angelica and purple loosestrife

4.22 Annex 1 Habitats

Annex 1 habitats are those listed on the Council Directive 92/43/EEC (1992) Habitats Directive and are regarded as "Sites of Community Importance" (Natura 2000). The following Annex 1 habitats were recorded within the survey area:

Table 7: Annex 1 Habitats recorded within the survey area

Habitat	Area	Grid Reference
Bog Woodland	0.89	IR 65591 86358
	7.70	IR 66590 85857
	2.79	IR 69598 86008
	0.75	IR 70506 86361
	1.36	IR 76620 87919
European Dry Heaths and temperate Atlantic wet heaths.	7.23	IR 65196 77925
	0.11	IR 65791 78821
	1.20	IR 67223 80727
	13.29	IR 67774 80664
	0.67	IR 67683 80387
	0.29	IR 67973 80444
	20.28	IR 75736 90266

4.23 Invasive Species

Japanese knotweed (*Fallopia japonica*)

Japanese knotweed is an invasive plant species which can be detrimental to the biodiversity of habitats once it becomes established. Japanese knotweed was found within the survey area on several occasions (see table 8) and was the only invasive species recorded during the habitat survey.

Table 8: Identification of stands of Japanese knotweed within the study area.

Stand	Grid Reference
1	IR 71465 86951 (Mountshannon)
2	IR 69877 72085 (Shantraud)
3	IR 66822 86056 (Meenross)
4	IR 67190 86342 (Meenross)
5	IR 66908 86553 (Meenross)
6	IR 68773 85852 (Cloontyconnaught)

5 CONCLUSION

A Habitat Survey using Fossitt level 3 methods was carried out on approximately 65 km² area within County Clare in 2008. The survey aims were to locate habitats of species richness and to provide baseline data on the status of habitats of biodiversity value in the county and to identify areas of local biodiversity importance and ecological corridors.

Within the survey area, there were a large proportion of existing designated areas consisting of SPA, NHA and SAC. These designations were often associated with Lough Derg and included habitats, such as swamps and reed beds that are classed as rare within County Clare as stated within the Clare Biodiversity Action Plan. These areas were not sampled during the survey. Outside these designated areas it was found that a large proportion of the survey area consisted of improved agricultural habitat which is of low ecological importance. There were however, habitats of greater species richness within the survey area. There were 42 such areas identified, which included species rich wet grassland, acid grassland, heath, marsh and semi-natural broadleaved woodland. In addition to this, 12 sections of semi-natural woodland were identified that were regarded as being important ecological corridors. In order to preserve these species rich areas, it is recommended that development must not be allowed to impact on these areas to ensure that these habitats and ecological corridors are protected or enhanced in order to maintain and improve the level of biodiversity within the county.

Given the time-scale of this survey work it was not possible to carry out detailed surveys of areas of higher ecological interest and in some cases it is recommended that further survey work is carried out to establish a full species list to establish the ecological value of these areas.



References

ERM (2000) Landscape Characterisation in Co Clare. The Heritage Council, Kilkenny

Fossitt JA (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny

www.npws.ie National Parks and Wildlife Services website

Natura (2005) Habitat Survey Guidelines: A standard methodology for habitat survey and mapping in Ireland. The Heritage Council

APPENDIX 1

Scope of Works

The following text is the scope of works that was agreed with Clare County Council and Scott Wilson on 16th May 2008.

An area not less than 94 km² as in map already presented to Scott Wilson will be surveyed and mapped to habitat level three as per "A Guide to Habitats in Ireland". This information will be delivered in a GIS Dataset compatible with Clare County Council GIS. Aerial photos will be used as part of the desk-based exercise to identify areas of improved and arable habitats, and as such will not be walked "field by field" during the site visit. These areas will be ground-truthed from vantage points during the site visit, to ensure that the habitat classification has not changed since the aerial photograph was taken. Similarly, woodlands already surveyed during the NPWS Native Woodland Survey and Commercial Forestry will not be walked "field by field". The habitat map will differentiate between areas that have been walked "field by field" and those that were surveyed from aerial photos and vantage points. Should any areas be inaccessible, they will be highlighted as such on the habitat map.

BACKGROUND

Lough Derg and Environs hosts a broad diversity of natural and semi-natural habitats reflecting its geographical position on the east of County Clare. These include lake, rivers and other wetlands, grasslands and woodlands. While there is considerable information pertaining to areas of the county proposed for designation as Special Areas of Conservation, Special Protection Areas and Natural Heritage Areas, there is less information relating to habitats outside these sites. It is envisaged that the information, which will be generated by this project, will be used to provide baseline data on the status of habitats of biodiversity value in the county and to identify areas of local biodiversity importance and ecological corridors. This information will inform the prioritisation of future work to be initiated through the

accommodate this, Clare Co Council will forward the surveyors a list of the Level 3 habitats that they deem to equate to (i) local biodiversity value and (ii) important ecological corridors - and provide further information on what is expected in terms of assigning buffer zones. This information will then be provided within a succinct table in the report, to highlight which habitat compartments are of particular note.

- The generation of summery information of the total habitat resource of the survey area (i.e. area of each habitat type)

*All habitats except hedgerows, treelines, earth banks and stonewalls should be mapped as closed polygons. These can be mapped linearly using aerial photography in conjunction with the 6-inch sheets.

**All mapping should be carried out with reference to the Irish National Grid rather than ITM projection.

INFORMATION TO BE PROVIDED TO THE CONTRACTORS

Clare County Council OSI mapping will be supplied a number of digital datasets such as FIPS, Corine Landcover, OSI Aerial Photographs (2005), roads etc will be available. Other relevant digital datasets (e.g. detailed habitat survey information held by the National Parks and Wildlife Service) will be obtained directly. All raw data will be presented to Clare County Council following completion of the survey work.

TIMESCALE

Desk-based work will start in early May. Dr. John Crosse, NPWS Woodland Specialist confirmed by telephone on the 21.04.08 that and the information from the NPWS Native Woodland Inventory will not be available until June. This will contain GIS information, and detailed habitat notes for each woodland compartment (above 1ha) in the Study Area, therefore it is proposed that field survey work does not commence until this report is available to make best use of the surveyors time. This would mean that survey work would not commence until mid/end June and we could have an interim report by end July, and the final report, GIS dataset and supporting information will be due for submission by the end of August 2008.

County Biodiversity Action Plan (in draft) as well as future planning policy and development on the shores of Lough Derg. It is not required to survey designated sites within the survey area of 94 km².

THE PROJECT

The project is to map and provide supplementary information relating to all habitats within the survey area, to level 3 of the Fossitt (2000) classification system; indicate correspondence with Annex 1 habitats where appropriate and to survey, map and provide supplementary information relating to sites of local biodiversity value and ecological corridors within the survey area; Survey and mapping shall be based on the methodology outlined in the Heritage Council (draft) Habitat Survey Guidelines (2002). The collection and presentation of all data shall adhere to Clare County Council GIS Data Standards.

The mapping process will involve:

- Review of relevant datasets, GIS layers and literature and available information pertaining to the survey area;
- Desk based mapping to Level 2/3 of the Fossitt classification system of specified habitats;
- Survey and identification of specified habitats to level 3 of the Fossitt and Annex I (Habitats Directive) classification systems within the survey area;
- The provision of summary target notes and photographic records for habitats surveyed in the field in accordance with the Heritage Council draft methodology cited above; Summary target notes will be produced according to Appendix 4 of the Heritage Council Habitat Survey Guidelines and will provide sufficient information to support the allocation of habitats to particular categories e.g. by listing indicator species for that habitat. These field notes will also highlight sites that are particularly botanically diverse and may warrant further in-depth botanical survey.
- The identification (desk and field) and mapping of areas of local biodiversity value, ecological corridors and buffer zones and the provision of target notes and photographic records for these areas, in accordance with a methodology to be agreed with the Local Authority; In order to

PROJECT MANAGEMENT

Day to day contact will generally be with the Heritage Officer, Clare Co. Council. A working group comprising of representatives of the Clare Biodiversity Working Group, Clare Co. Council and the National Parks and Wildlife Service will guide the development of this project. This group will meet as necessary to review progress with the project. These meetings will take place in Killaloe.

REQUIRED OUTPUTS AND PRESENTATION OF DATA

- 1 Digital habitat map and GIS dataset for Lough Derg Area identifying
 - i. all habitats mapped to level 3 of the Fossitt classification system as specified in Appendix I;
 - ii. identification of all Annex I EU Habitats Directive habitats occurring within the survey area (this information will be provided in a succinct table based on information in Appendix 3 of The Heritage Council Habitat Survey Guidelines);
 - iii. identify and evaluate all key areas of local biodiversity value, ecological corridors and buffer areas identified within the survey area either through desk or field survey, in accordance with a methodology to be agreed and information provided by Clare County Council;
 - iv. total area of the main habitat type will be calculated.
 - v. Supplementary information pertaining to habitats and areas surveyed in the field including habitat descriptions, species lists, site/habitat evaluations and photographs provided within the target notes; - this will be in the form of summary target notes produced according to Appendix 4 of the Heritage Council Habitat Survey Guidelines and will highlight sites that are particularly botanically diverse and may warrant further in-depth botanical survey.
 - vi. A GIS habitat map will be produced, enclosing all habitat compartments as closed polygons and will illustrate the locations of target notes and photographs. The target notes and photographs will be identified via mapping coordinates (x,y / GPS) in order to clearly associate them with the actual site

vii. the areas mapped by field survey and the areas mapped using remote techniques;

2 Six hard copies and digital copy of final report for the relevant Area to include

- Technical summary;
- Introduction and outline of the methodology;
- Summary description of the mapped area and habitats occurring within it;
- Summary descriptions of areas identified to be of high ecological value presented as target notes and a Table to show habitats which equate to Annex I habitats, habitats of local biodiversity importance, important ecological corridors etc;
- Estimated length of hedgerow habitat within the area;
- Paper copy of the habitat map (Scale 1:10,560, A3 size pages) with legend;
- Detailed conservation management measures are not required. Comments in relation to the management of such areas would be welcome, particularly if they are under threat from present management regimes. A summary sheet/check list will form part of the report
- Any other pertinent information;
- Conclusions and references.

APPENDIX 2

Map of survey area with target note numbers of notable areas of habitat.



APPENDIX 3

Target Notes

Target Note	Grid Reference	Habitat	Note
1	IR 68209 70396	GM1	Area of marsh with much standing water due to a particularly high rain fall. This area of marsh is dominated by <i>Juncus effusus</i> , <i>Filipendula ulmaria</i> , <i>Cirsium palustre</i> and also has <i>Lychnis flos cuculi</i> , <i>Ranunculus flammula</i> , <i>Mentha aquatica</i> , <i>Hydrocotyle vulgaris</i> and <i>Galium palustre</i> . There is also occasional <i>Sparganium emersum</i> . Plate 1
2	IR 68533 70437	GS4	Species rich area of wet grassland with <i>Agrostis</i> sp, <i>Arrhenathrum elatius</i> and <i>Holcus lanatus</i> . There is also <i>Juncus acutiflorus</i> and <i>Juncus effusus</i> . Also present, is frequent <i>Rhinanthus minor</i> , occasional <i>Galium palustre</i> , locally abundant <i>Iris pseudacorus</i> and frequent <i>Filipendula ulmaria</i> .
3	IR 68233 70607	GS4	Ungrazed or little-grazed marshy grassland, species-rich, dominated by rushes (including <i>Juncus effusus</i> and <i>Juncus acutiflorus</i>), but with frequent to abundant <i>Filipendula ulmaria</i> and small sedges. Locally frequent <i>Succisa pratensis</i> and <i>Plantago lanceolata</i> . Frequent <i>Lotus pedunculatus</i> and <i>Mentha aquatica</i> . Orchid sp. rare. Scattered very young <i>Salix cinerea</i> .
4	IR 68154 70697	GS1	Disturbed sloping ground with patchy <i>Pteridium aquilinum</i> , dominated by <i>Agrostis</i> sp. and <i>Holcus lanatus</i> . Locally abundant <i>Centaurea nigra</i> and <i>Lotus pedunculatus</i> . Most of the <i>Pteridium aquilinum</i> has been mechanically removed.
5	IR 69377 71512	GS4	Wet grassland dominated by <i>Holcus lanatus</i> and <i>Agrostis</i> sp and <i>Juncus acutiflorus</i> but also locally abundant <i>Pedicularis sylvatica</i> and occasional <i>Galium palustre</i> .
6	IR 68806 71960	WN2	Woodland along banks of small river with <i>Fraxinus excelsior</i> / <i>Corylus avellana</i> / <i>Acer pseudoplatanus</i> / <i>Salix</i> sp. Ferns abundant including <i>Dryopteris filix-mas</i> , <i>Dryopteris dilatata</i> and <i>Phyllitis scolopendrium</i> . <i>Hedera helix</i> and <i>Rubus fruticosus</i> abundant. <i>Circea lutetiana</i> is occasional.
7	IR 69844 72161	GS4	Area of wet grassland where <i>Juncus</i> spp. are abundant with <i>Juncus acutiflorus</i> and <i>Juncus effusus</i> . There is also frequent <i>Iris pseudacorus</i> , <i>Mentha aquatica</i> , <i>Filipendula ulmaria</i> and frequent <i>Centaurea nigra</i> .
8	IR 69863 72076		Area of <i>Fallopia japonica</i> at field boundary
9	IR 68582 72826	GS4	Grazed marshy grassland dominated by rushes but with locally frequent <i>Iris pseudacorus</i> and <i>Filipendula ulmaria</i> . Abundant <i>Ranunculus</i> sp. and <i>Lotus pseudacorus</i> . Peripheral <i>Salix cinerea</i> and <i>Ulex europaeus</i> .
10	IR 67919 73342	WN2	Narrow strip of woodland along small river dominated by <i>Fraxinus excelsior</i> and <i>Salix</i> sp. with occasional <i>Crataegus monogyna</i> . Typical ground flora including <i>Rubus fruticosus</i> , <i>Hedera helix</i> , ferns and <i>Circea lutetiana</i> .

Target Note	Grid Reference	Habitat	Note
11	IR 68143 74397	GS4	Species rich wet grassland with abundant <i>Potentilla anserina</i> , <i>Iris pseudacorus</i> , <i>Lythrum salicaria</i> , <i>Filipendula ulmaria</i> , <i>Stachys sylvatica</i> , <i>Rumex obtusifolius</i> , <i>Centaurea nigra</i> , <i>Senecio aquaticus</i> , <i>Angelica sylvestris</i> and <i>Persicaria maculosa</i> . Grasses include abundant <i>Agrostis stolonifera</i> .
12	IR 68078 74416		<i>Sambucus ebulus</i> – IR 6816 7433
13	IR 66862 75315	GS3	Area of wet acid grassland where <i>Agrostis capillaris</i> is dominant and there is frequent <i>Potentilla erecta</i> . Also, <i>Juncus effusus</i> and <i>Holcus lanatus</i> are frequent. <i>Pteridium aquilinum</i> , <i>Cirsium palustre</i> , <i>Juncus articulatus</i> and <i>Lotus pedunculatus</i> are all occasional.
14	IR 67822 76291	GS4	Marshy grassland, on lower slopes little-grazed with abundant rushes (<i>Juncus effusus</i> and <i>Juncus acutiflorus</i>) and <i>Iris pseudacorus</i> , and scattered <i>Salix</i> sp. and <i>Ulex europeus</i> . Abundant <i>Ranunculus repens</i> and <i>Holcus lanatus</i> ; variable amounts of <i>Cirsium palustre</i> and <i>Lotus pedunculatus</i> ; locally frequent <i>Ranunculus flammula</i> . The uppermost slopes are heavily grazed with scattered <i>Iris pseudacorus</i> . Plate 2
15	IR 67860 76181	WN2	Thin strip of woodland along stream, <i>Corylus avellana</i> and <i>Betula</i> sp dominant in upper parts, but mixed lower down with <i>Fraxinus excelsior</i> , <i>Fagus sylvatica</i> and <i>Quercus</i> sp, and occasionally <i>Sorbus aucuparia</i> . Mosses abundant, with frequent ferns (including <i>Blechnum spicatum</i> and dryopterid ferns), and locally abundant <i>Hedera helix</i> and <i>Rubus fruticosus</i> (becoming more frequent downslope). Occasional <i>Viola riviniana</i> and <i>Lonicera periclymenum</i> . <i>Chrysosplenium oppositifolium</i> occurs locally. The woodland continues down towards Lough Derg, and in its lower parts is mainly composed of <i>Quercus</i> sp., <i>Fagus sylvatica</i> , <i>Fraxinus excelsior</i> and <i>Acer pseudoplatanus</i> , with frequent <i>Crataegus monogyna</i> ; similar plants occur in the ground flora, but there is more <i>Hedera helix</i> and occasional <i>Sanicula europaea</i> . Plate 3
16	IR 67934 76190	WN6	Wet flushed woodland composed of <i>Fraxinus excelsior</i> , <i>Betula</i> sp. and <i>Salix cinerea</i> . Ground flora dominated by grasses with locally dominant <i>Chrysosplenium oppositifolium</i> , and abundant <i>Ranunculus repens</i> . Occasional <i>Juncus effusus</i> , <i>Cirsium palustre</i> , <i>Filipendula ulmaria</i> and <i>Circea lutetiana</i> . Plate 4
17	IR 68034 76235	WD1	The canopy of this part of the woodland is of natural native species (<i>Betula pubescens</i> and <i>Crataegus monogyna</i> , with frequent <i>Fraxinus excelsior</i> and <i>Corylus avellana</i> , some of the latter large and old) but the ground is mostly so heavily poached by cattle and largely bare that it is best classified as modified woodland. Plate 5
18	IR 68071 76344	WN2	This part of the woodland suffers some cattle poaching but not as severely as in the previous target note. Birch, hazel and ash dominate, with some willow and hawthorn. Bramble and ferns are frequent beneath. In places wood sorrel is abundant. Primrose is occasional. Plate 6

Target Note	Grid Reference	Habitat	Note
19	IR 66132 76714	WN6	Wet woodland dominated by alder. Alder is regenerating in the understorey. Bramble and creeping soft-grass are abundant beneath. Less frequent species include marsh thistle, ferns and devil's-bit scabious. Yellow pimpernel is rare. The woodland block to the north is semi-mature coniferous plantation (not semi-natural as shown in NPWS GIS file). Plate 7
20	IR 66202 76996	WN2	Woodland along stream, with a mix of ash, sycamore, alder and willow. Bramble and meadowsweet are abundant beneath. Frequent associates include hard fern, dryopterid ferns and enchanter's-nightshade.
21	IR 66768 76887	WN6	Wet woodland dominated by downy birch and grey willow. Bramble abundant beneath; other species include bent grass and wood horsetail.
22	IR 67716 77054	GS4, WN6	Fenced-off marshy grassland and wet woodland. The latter is very dense grey willow and downy birch, with abundant bramble and bent grass beneath, ivy and wood sorrel in places, and species such as tufted hair-grass, opposite-leaved golden-saxifrage and yellow pimpernel in wet parts. The marshy grassland shows some signs of grazing but not very much. It is mostly dominated by rushes (mainly sharp-flowered rush but also soft rush), with frequent meadowsweet and large bird's-foot-trefoil, occasional mint, and rarely orchids (<i>Dactylorhiza</i> sp.); locally there is purple moor-grass with occasional tormentil. There is scattered grey willow and gorse. Plate 8
23	IR 67995 77365	FS1, GM1, WN6	An area of swamp and carr dominated by common reed and grey willow adjacent to Lough Derg. The open areas of swamp contain developing willow. There is a small section of marsh dominated by meadowsweet, with iris and large bird's-foot-trefoil. Plate 9
24	IR 68229 77649	GS4, WN6	The western end of these marshy grassland fields (much of which is cut) is wetter and richer, and grades into wet grey willow carr by the loch. The richer marshy grassland is dominated by rushes (mainly compact rush), but also contains frequent devil's-bit scabious and large bird's-foot-trefoil, and more locally purple loosestrife, yellow loosestrife and common reed.
25	IR 68309 78165	FW8	Man-made pond with limited peripheral vegetation, including some planted willows and birches, gorse and reedmace.
26	IR 67670 77869	FW8	Very recently dug artificial pond, currently in grounds of new house, currently with very little associated vegetation apart from some scattered peripheral reedmace.
27	IR 67373 78101	WN6	Large wet woodland dominated by grey willow and downy birch. Very wet beneath, including species such as iris and water horsetail.
28	IR 65423 77970	GS3, HH1	The only extensive area of true acid grassland encountered in this area (adjacent grasslands are too heavily grazed and/or improved to leave acid indicators, thus coded as GS1). Predominant grass species include common bent, sweet vernal-grass and sheep's-fescue. Herbs include occasional heath bedstraw and tormentil. There is scattered ling, bracken and scrub (including gorse, hawthorn and birch). The grassland

Target Note	Grid Reference	Habitat	Note
			is subject in many places to cattle grazing. To the north and east ling becomes dominant forming dry heath.
29	IR 67014 78970	WN2	Narrow strip of woodland along stream, dominated by ash, willow and hazel, but including other trees such as beech and sycamore. There is a reasonable ground flora including species such as sanicle, wood sorrel, remote sedge, hard fern, dryopterid ferns and bramble.
30	IR 66208 79560	GS1	Relatively species-rich grassland, not grazed at time of survey but probably horse-grazed at times. Bent grass dominant, but often with abundant red fescue. Yarrow, autumnal hawkbit, red clover and ribwort plantain are all frequent to abundant. Plate 10
31	IR 69475 79267	WN6	Wet woodland dominated by downy birch and grey willow. Common ground flora species include iris, remote sedge, stinging nettle and herb Robert. Plate 11
32	IR 69547 79642	WN6, WN2, GS4	Wet woodland dominated by grey willow and ash, next to marshy grassland, with adjacent strip of drier woodland dominated by ash, beech and oak. The wet woodland has purple moor-grass and iris in the ground flora, and grades into the marshy grassland with some scattered willow, where the principle species are purple moor-grass, tufted hair-grass and iris. The drier woodland strip, along a small stream, has a ground flora principally of ferns (including hard fern and dryopterid ferns), false brome, bramble, honeysuckle and cock's foot.
33	IR 69855 80568	FS2	Scattered willow species within this tall-herb swamp. There is abundant meadowsweet, marsh willowherb and frequent Carex species.
34	IR 70274 81028	GM1	Area of species rich marsh dominated by <i>Juncus effusus</i> , sharp flowered rush and meadow sweet abundant with much standing water. Other species present include locally dominant iris, frequent marsh thistle, lesser spearwort, water mint and silverweed. There is some gorse encroachment to this area. Plate 12
35	IR 70352 81010	GS4	Very nice species rich wet grassland with abundant meadowsweet, abundant false-oat grass, black knapweed, frequent purple loosestrife, devil's bit scabious and large bird's-foot-trefoil.
36	IR 70901 81282		Eutrophic empty pond.
37	IR 64399 85111	GS4	Grazed marshy grassland is extensive in this area, dominated by soft rush but with frequent hard rush. In the vicinity of this target note it is richer, with frequent large bird's-foot-trefoil and marsh thistle, and occasional angelica, purple loosestrife and marsh ragwort. Very locally there is some bur-reed and reedmace but insufficient to map as swamp.

Target Note	Grid Reference	Habitat	Note
38	IR 65545 86345	WN7, GS4	Small area of damp birch woodland beside marshy grassland. The woodland is dominated by downy birch, but there are some conifers, mostly dead. Rather species-poor ground flora dominated by bramble, with frequent ivy and ferns, and some willow regeneration. At the edge of the wood beside the marshy grassland there is a small amount of greater tussock-sedge. The adjacent marshy grassland to the west is fenced off and apparently not- or little-grazed. It is dominated by rushes (both soft rush and sharp-flowered rush), with frequent marsh thistle, large bird's-foot-trefoil and Yorkshire fog, and, less commonly, angelica and purple loosestrife. The marshy grassland to the north is heavily grazed and species-poor.
39	IR 66446 85865	GS4	High quality marshy grassland dominated by sharp-flowered rush, with frequent small sedges. Common herbs include purple loosestrife, large bird's-foot-trefoil, mint and marsh thistle. In the wettest patches there is some marsh pennywort and marsh cinquefoil. Open to grazing but little evidence of it. Plate 13
40	IR 66600 85931	FS1	This area could not be accessed owing to large ditches deemed too dangerous to cross around the surrounding woodland, combined with very dense vegetation along the eastern edge of the woodland. Judging from the aerial photograph and the nature of the surrounding woodland (with birch and willow) this area is likely to be swamp, possibly with willow carr. On the aerial photograph it is similar in colour to areas elsewhere dominated by common reed, suggesting common reed is also present here. Further investigation in this area is recommended.
41	IR 66608 85807	WN7	Natural woodland dominated by downy birch, but with occasional to abundant grey willow and ash. This woodland was only surveyed from the periphery because large and very deep ditches run close to the edge and were deemed too dangerous to cross, and along the eastern edge the vegetation is very dense. The ground flora that could be seen is often dominated by bramble, but purple moor-grass is frequent in places and sometimes dominant. Ferns are frequent including hard fern and broad buckler-fern. Locally where grazing animals can access the edge the ground is more grassy and poached. There is open ground in the centre of the wood (see following target note).
42	IR 66807 85689	GM1	Dense marsh dominated by meadowsweet, but with abundant purple loosestrife. There are scattered bushes of grey willow. Fenced off and not grazed. Plate 14
43	IR 66819 86073	GS4	The marshy grassland here is of no great note (grazed soft rush/meadowsweet with scattered purple loosestrife) but is target-noted because of the presence of invasive Japanese knotweed at the north end, disturbance of which should be avoided in order to prevent further spread.
44	IR 66598 87035	WN2	Narrow strip of ash-dominated woodland along small river, with frequent sycamore and hazel. There is regeneration of ash and sycamore. Bramble and ivy are abundant beneath, along with frequent ferns (including hard fern and dryopterid ferns). Opposite-leaved golden-saxifrage is locally abundant in damp patches. Great woodrush is locally

Target Note	Grid Reference	Habitat	Note
			frequent. Plate 15
45	IR 66893 86540	WS1	This area of river-side bramble scrub is target-noted because the presence of invasive Japanese knotweed, disturbance of which should be avoided in order to prevent further spread.
46	IR 67196 86345	WN2	Narrow strip of woodland along river, dominated by ash and sycamore, with frequent hazel, grey willow and hawthorn. Bramble is dominant beneath, with frequent ferns. Invasive Japanese knotweed is locally dominant and should not be disturbed, to avoid further spread.
47	IR 67846 85813	GS4	The low end of this field is marshy grassland dominated by soft rush. Grazing animals have access but only seem to affect the drier south end. Hard rush is locally frequent. Frequent herbs include purple loosestrife, meadowsweet, large bird's-foot-trefoil, angelica and marsh thistle. There are scattered bushes of hawthorn and bramble in the drier parts, whilst to the north-east there are scattered grey willows. Greater willowherb is present at the edge. Plate 16
48	IR 68573 87008	WN2	Triangle of natural woodland dominated by downy birch but classed as WN2 on basis of frequency of ash and grey willow. There are peripheral mature beeches on the east side. Bramble and ivy are dominant beneath. There is some dead wood. On ground to the immediate east and west trees and scrub have been removed, leaving rough marshy grassland to the west; to the east there is a large area of recently sown improved grassland with improved drainage ditches, leaving a smaller marshy area at the bottom of the field.
49	IR 68861 86370	FS1	The golf course here contains a number of small man-made ponds which are now full of swamp dominated by reedmace (<i>Typha latifolia</i>). Some of them also contain bulrush (<i>Schoenoplectus lacustris</i>), bur-reed and watercress. The largest has a central island of willows.
50	IR 68773 85857	WS1	This small patch of scrub is target-noted because of the presence of a substantial amount of Japanese knotweed, which should not be disturbed to avoid its spread.
51	IR 68820 85815	GS4	Marshy grassland dominated by soft rush but with abundant sharp-flowered rush. It is ungrazed, with occasional to frequent meadowsweet, and locally abundant devil's-bit scabious, and scattered purple loosestrife. Plate 17
52	IR 69129 85873	WN2	A small raised island of birch, oak and hazel, with some willow to the edges. Worth further investigation.
53	IR 69566 85961	WN7	Birch-dominated natural woodland, with grey willow abundant locally especially nearer the loch. The trees are of variable age, some being quite old. Bramble is dominant beneath but there are areas with purple moor-grass. Alder, holly and rowan are occasional. Plate 18
54	IR 69826 86323	FS1	Large area of swamp dominated by rushes and in places common reed. Water horsetail is abundant. Frequent herbs include meadowsweet, angelica, mint and iris. Purple loosestrife is occasional. There is a lot of

Target Note	Grid Reference	Habitat	Note
			alder regeneration, and some scattered willow. Plate 19
55	IR 69817 86545	GS2, WN2	A small ungrazed meadow and adjacent natural woodland. The meadow is dominated by bent grass, with frequent red fescue and sweet vernal-grass. Ribwort plantain, white clover and autumnal hawkbit are all abundant; black knapweed and red clover are frequent. Locally in damper parts there is some large bird's-foot-trefoil. The adjacent woodland, which surrounds the meadow on all sides except the east, contains a dense mix of birch, hazel and ash, with occasional oak and alder. Bramble is abundant beneath, and there is frequent ivy and, more locally, bracken. Plate 20
56	IR 70008 86875	WN2	Small roadside strip of natural woodland dominated by downy birch and ash, with frequent grey willow, hawthorn and holly. There are several half-fallen trees. Bramble and ivy are most dominant beneath but there is also frequent false-brome and bluebell. There are some marshy patches. Plate 21
57	IR 70480 86368	WN7	Area of woodland, within young ash plantation, dominated by downy birch. Purple moor-grass and bramble are dominant beneath. Plate 22
58	IR 70652 86827	FS1, GS4, WS1	Strip of swamp dominated by water horsetail and iris. Meadowsweet locally abundant. There is a small amount of grey willow scrub. Grades to the north into marshy grassland with rushes, stinging nettle and bindweed, plus occasional marsh woundwort, iris and purple loosestrife.
59	IR 70745 86875	GS2, GS4	Field above water works, partly dry with ungrazed bent grass and Yorkshire fog and frequent ribwort plantain, grading into marshy grassland with the addition of occasional purple loosestrife and a lot of scattered young grey willow.
60	IR 71406 87077	GS4	Area of wet grassland dominated by Juncus spp. This area is grazed but is fairly species rich with abundant Yorkshire fog, and frequent Agrostis. Creeping buttercup is dominant and white clover is abundant, purple loosestrife occasional, rare lousewort.
61	IR 71539 86919	WN6	Area of wet woodland dominated by willow, alder and birch with frequent bramble. There is an open area of wet grassland in the middle of this woodland that is dominated by abundant meadowsweet and large bird's-foot-trefoil. There is abundant soft rush, creeping buttercup. There is abundant false oat grass and Yorkshire fog and frequent marsh thistle.
62	IR 71713 86708	WN6	Small area of wet willow carr between road and conifer plantation. This area is flooded with patches occasional reed.
63	IR 71917 86606	WN4	Area of wet woodland with oak and birch dominant but with additional species alder and ash abundant. The ground flora is composed of herb Robert, ground ivy, remote sedge and fern spp. There is also frequent moss spp. Plate 23
64	IR 71964 86638	GS4	Clearing in middle of wet woodland. Species rich wet grassland with abundant Yorkshire fog and cock's foot and soft rush. Iris is locally

Target Note	Grid Reference	Habitat	Note
			dominant and there is abundant meadowsweet and large bird's-foot-trefoil, frequent marsh willowherb and purple loosestrife. Plate 24
65	IR 72001 86461	GS4	Area of wet grassland with abundant false-oat-grass and Yorkshire fog. There is occasional purple loosestrife and lousewort and abundant creeping buttercup and large bird's-foot-trefoil.
66	IR 72224 87123	WD1	Small area of woodland dominated by ash and sycamore. The understorey is dominated by hawthorn and the ground flora is made up of herb Robert, fern spp and bramble.
67	IR 72172 87217	WD1	Area of young woodland composed of alder/oak/birch and rowan.
68	IR 72158 87267	GS4	Wet grassland with scattered willow carr. <i>Holcus lanatus</i> and False oat grass are abundant. Meadowsweet marsh thistle and creeping buttercup are abundant and purple loosestrife is frequent.
69	IR 74404 89527	GS1	Semi-improved grassland with locally dominant soft rush, abundant Yorkshire fog and bent sp. and occasional gorse, marsh thistle, meadow buttercup, marsh-bedstraw, creeping buttercup, white clover, hard rush, broad-leaved dock. Herbs are suppressed by grazing, this area may be more interesting.
70	IR 74609 88982	GS4	This is a nice fragment of wet grassland that is integral to the lake area. There is abundant soft rush, jointed rush, silverweed, common bent. Bracken is locally abundant and there is frequent Yorkshire fog, white clover and locally frequent rosebay willowherb. There is occasional bog-myrtle, purple-moor grass angelica, gorse, black knapweed and creeping buttercup.
71	IR 75028 89524	GS1	Area of semi-improved neutral grassland. There are wet areas within the field however which support soft rush and purple loosestrife. Other plants present include frequent creeping buttercup, meadow buttercup, creeping bent, Yorkshire fog, marsh thistle, ribwort plantain, sharp flowered rush, common sorrel, white clover, red clover, broad-leaved dock, black knapweed and tufted vetch.
72	IR 76242 86984	WN2	This woodland is composed of ash, oak with sycamore with an understorey of holly, ivy and elder. Within the ground flora there is herb Robert and fern sp.
73	IR 76243 86927	FS1	Adjacent to the WN2 noted on TN1, there is swamp habitat that is composed of reed, iris and <i>Juncus</i> . On the other side of this swamp habitat there is wet willow and ash woodland.
74	IR 76304 88358	WD2	Plantation on ancient woodland soil where beech is dominant and there is frequent hazel and occasional ash and elm. Within the ground flora there is abundant bluebell and ivy. There is also frequent herb Robert, fern species and primrose. There is also occasional bracken, enchanter's nightshade, lords and ladies and wood avens.
75	IR 76696 88221	GS4/G S2	Wet/dry matrix of wet grassland and dry grassland. There is scattered gorse, abundant sweet-vernal grass and Yorkshire fog, frequent field thistle, silverweed and locally frequent false-oat grass. Red clover, ragwort, soft rush and black knapweed are occasional.

Target Note	Grid Reference	Habitat	Note
76	IR 77166 88427		Spindle present within hedgerow
77	IR 77605 88032	WN4	This area of wet pedunculate oak-ash woodland has abundant ash and alder and frequent hazel. Willow is dominant. The ground flora consists of frequent reed, gorse, meadowsweet, bramble and hedge bindweed. There is occasional false brome, angelica, valerian, field rose, yellow iris and guelder rose. Spindle is also present within this woodland, but it is rare.
78	IR 77729 88161		Spindle present as small plant emerging from hedge. It is being suppressed by the management of the hedge. Grid reference IR 7534 8786.
79	IR 77846 89439	WD1	Couldn't get access to this field as it was surrounded by very wet woodland and there were cows in the adjacent field and there was a very high hedge so couldn't see over into field. Woodland was young and had birch/ash/sycamore. Might have some interest given close proximity to Lough Derg and may warrant further investigation.
80	IR 77541 90963	WD4	This conifer plantation was being felled at time of survey (August 2008)
81	IR 75973 89847	GS4	Extensive area of species rich wet grassland with abundant <i>Juncus</i> spp, silverweed, black knapweed and meadow sweet. Also with abundant false-oat-grass, Yorkshire fog and sweet vernal grass. This area was very wet at the time of survey, further investigation is recommended as access was difficult. Plate 25
82	IR 75679 90274	HH1	Area of heath. Couldn't get access to this habitat due to the surrounding land being flooded which made it too dangerous to access. Given the mosaic of different habitats within this area of heath, which included young willow scrub, bracken it is possible that this area is cutover bog. However, due to the area not being accessed it is not possible to determine which type of heath habitat this is. Plate 26
83	IR 75366 90883	GS4	Wet grassland dominated by <i>Juncus</i> sp, but with purple loosestrife locally wetter with water horsetail. There is encroachment from surrounding alder and willow into this area.
84	IR 74989 91547	WN2	Narrow strip of woodland running along watercourse. Ash is dominant with scattered sycamore. There is frequent holly within the understorey and the ground flora is composed of ground ivy, bramble, ivy and herb Robert.
85	IR 71374 87206	WN2	Narrow strip of woodland running along river bank with Oak/Beech/Ash with some sycamore. The ground flora is composed of abundant holly and ivy with frequent herb Robert, <i>viola</i> sp, fern spp. and bramble.
86	IR 76462 87282	WN2	This area of woodland is dominated by mature ash, with an understorey of holly and hawthorn.
87	IR 67648 76660	WN2	Thin strip of woodland along stream which includes native and non-native species, but has a reasonable ground flora so classed as semi-natural. Dominant trees are ash, beech and sycamore, with birch higher up. Frequent ferns (including hard fern, hart's-tongue fern and

Target Note	Grid Reference	Habitat	Note
			dryopterid ferns) and ivy, and occasional enchanter's nightshade and honeysuckle. Adjacent strip on south side is grazed modified non-native woodland with much beech.
88	IR 69271 79965	GM1	Area of marsh dominated by iris but with locally frequent fool's watercress, and rarely hemlock water-dropwort.
89	IR 65634 86717	GS4	Marshy grassland of variable nature. At the bottom of the slope sharp-flowered rush is dominant but accompanied by soft rush, marsh thistle and iris. On the hillside sharp-flowered rush is accompanied by frequent redshank, which is locally dominant. A large strip of the slope is eroded with bare earth; here there is a mix of pioneer species including self-heal, Yorkshire fog, ribwort plantain and creeping buttercup.
90	IR 67823 73127	GS4	Small area of wet grassland that is dominated by creeping bent, and has abundant iris. There is frequent perennial rye grass and Yorkshire fog. Herb species that are frequent include greater bird's foot trefoil, lesser spearwort, silverweed, broad-leaved dock, hedge woundwort, and common mouse ear is occasional.
91	IR 67036 80779		Dwarf Elder – IR 6653 8124
92	IR 66094 82658	WN4	Wet pedunculate oak-ash woodland. Ash and sycamore are abundant and there is occasional pedunculate oak. In the understorey there is abundant hazel, frequent silver birch and occasional holly. Ground ivy and ferns are abundant and remote sedge and bramble are occasional and there is frequent nettle.
93	IR 66082 82987	GS4	Wet grassland. Clearing in felled plantation where tufted hair grass is dominant and there is abundant soft rush and occasional marsh thistle, purple loosestrife and lesser spearwort. There is frequent Yorkshire fog.
94	IR 65938 84180	WN6	Wet willow-alder-ash woodland where grey willow is dominant and there is abundant iris and marsh willow herb. There is also meadow sweet, Angelica, purple loosestrife, hedge bindweed and hemp-agrimony.
95	IR 74528 89269		Oligotrophic lake. Bottle sedge is locally abundant, common reed mace is locally frequent, common club rush is locally abundant, common spike rush is frequent, lesser spearwort is occasional, reed is locally abundant, jointed rush is occasional, bog myrtle is occasional and there is fine-leaved potamogeton.
96	IR 75038 89292	GS2	This is a nice area of dry meadow associated with a water tower. False oat grass, cock's foot and red fescue are abundant, black knapweed is frequent, yarrow is abundant, bird's foot trefoil is frequent, tufted vetch is frequent, white clover is occasional, ribwort plantain is frequent, common mouse ear is occasional, meadow vetchling and tufted vetch are occasional.
97	IR 75117 88288	GS4	It is recommended that this area of semi-improved should undergo a full survey and possible protection. There is abundant meadowsweet,

Target Note	Grid Reference	Habitat	Note
			frequent purple loosestrife, locally abundant reed mace, abundant sweet vernal grass, abundant to locally dominant Yorkshire fog, occasional marsh thistle, occasional wild angelica and black knapweed. There is also orchid potential within this area of grassland. Plate 27
98	IR 75890 88198	WN2	This area of semi-natural woodland is too dense to access and had to be surveyed from the periphery. Ash is dominant, oak is occasional. Within the understorey there is frequent elder, rose species and blackthorn and occasional holly. The ground flora is comprised of ground ivy, herb Robert and fern species.
99	IR 75830 88071	GS4	Access to this area was difficult, but it is of potential interest.. Further survey work is recommended. Frequent meadowsweet and occasional cross leaved heath, angelica and purple loosestrife.
100	IR 75524 87724	GS4	Pair of wet grassland fields. Both sort and jointed rush are abundant and there is also abundant creeping bent and frequent Yorkshire fog. Marsh thistle is locally abundant and purple loosestrife, redshank, autumn hawkbit, black knapweed, water mint and gorse are occasional.
101	IR 75164 87885	WN6	Wet wood with tall herb fen ground layer. Willow is dominant and there is also frequent hazel and there is occasional ash. In the ground layer there is purple loosestrife, Iris, angelica, hedge bindweed, nettle and bramble.
102	IR 74830 86951	GS1	Small meadow, borderline wet grassland, with high floristic value interest including orchid sp. Grid reference IR 7483 8696. Grass species include abundant bent species, frequent sweet vernal grass and occasional quaking grass. There is frequent jointed rush, red clover, greater-bird's foot trefoil, black knapweed, glaucous sedge and devil's bit scabious. There is occasional meadowsweet, hemp agrimony, purple loosestrife, common fleabane, selfheal, silverweed, tormentil, purple moor grass, soft rush and square stalked St John's wort. Plate 28
103	IR 74684 86852	GM1	Area of marsh with locally abundant creeping bent grass, water cress and greater bird's foot trefoil, frequent wild angelica, hoary willowherb, creeping buttercup, and meadow buttercup. There is also occasional purple loosestrife, black knapweed, marsh bedstraw and grey willow.
104	IR 74066 87745	GS4	Unimproved area of wet grassland with abundant Yorkshire fog, meadowsweet, soft rush and creeping buttercup. There is frequent purple loosestrife, hedge bindweed, creeping bent grass and occasional meadow buttercup and marsh woundwort. Plate 29
	IR 76800 87265	GS4	There is abundant iris and meadowsweet with frequent purple loosestrife, hard rush and soft rush, common fleabane, bramble, marsh thistle and grey willow. There is also occasional hoary willowherb. Plate 30

APPENDIX 4

Plates of notable areas of habitats recorded during the survey.



Plate 1 (IR 68209 70396) Area of marsh dominated by *Juncus effusus*, *Filipendula ulmaria*, *Cirsium palustre* and also with *Lychnis flos-cuculi*, *Ranunculus flammula*, *Mentha aquatica*, *Hydrocotyle vulgaris* and *Galium palustre*. There is also occasional *Sparganium emersum*.



Plate 2 (IR 67822 76291) Wet grassland with abundant *Juncus effusus*, *Juncus acutiflorus* and *Iris pseudacorus*. There is scattered *Salix* sp and *Ulex europaeus*. There is abundant *Ranunculus repens* and *Holcus lanatus*, variable amounts of *Cirsium palustre*, *Lotus pedunculatus*, and locally frequent *Ranunculus flammula*.



Plate 3 (IR 67860 76181) Thin strip of woodland along stream, *Corylus avellana* and *Betula* sp dominant in the upper parts, but mixed lower down with *Fraxinus excelsior*, *Fagus sylvatica* and *Quercus*, and occasionally *Sorbus aucuparia*. Mosses are abundant, with frequent ferns (including *Blechnum spicant* and dryopterid ferns), and locally abundant *Helix hedera* and *Rubus fruticosus* (becoming more frequent downslope).



Plate 4 (IR 67934 76190) Wet flushed woodland composed of *Fraxinus excelsior*, *Betula* sp. and *Salix cinerea*.



Plate 5 (IR 68034 76235) The canopy of this part of the woodland is of natural native species (*Betula pubescens* and *Crataegus monogyna*), with frequent *Fraxinus excelsior* and *Corylus avellana*, some of the latter large and old) but the ground is mostly so heavily poached by cattle and largely bare that it is best classified as modified woodland.



Plate 6 (IR 68071 76344) This area of woodland is dominated by *Betula* sp., *Corylus avellana* and *Fraxinus excelsior*, with some *Salix* sp. and *Crataegus monogyna*.

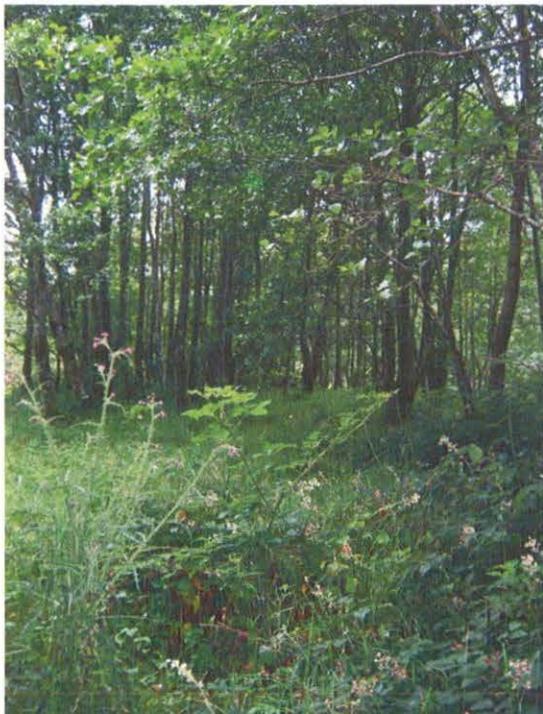


Plate 7 (IR 66132 76714) This area of wet woodland is dominated by *Alnus glutinosa*. *Rubus fruticosus* and *Holcus mollis* are abundant within the ground flora. Less frequent species include *Cirsium palustre*, ferns and *Succisa pratensis*.



Plate 8 (IR 67716 77054) This is a fenced off area of wet grassland and wet woodland. The woodland area is comprised of very dense *Salix cinerea* and *Betula pubescens* with abundant *Rubus fruticosus* and *Agrostis* sp beneath. The wet grassland is dominated by *Juncus acutiflorus* but also *Juncus effusus* with frequent *Filipendula ulmaria* and *Lotus pedunculatus*. There are also *Dactylorhiza* sp present here.



Plate 9 (IR 67995 77365) This area of swamp and carr is dominated by *Phragmites* and *Salix cinerea* and is adjacent to Lough Derg. There is a small area of marsh dominated by *Filipendula ulmaria*, with *Iris pseudacorus* and *Lotus pedunculatus*.



Plate 10 (IR 66208 79560) Relatively species rich grassland dominated by *Agrostis* sp. but often with *Festuca rubra*. *Achillea millefolium*, *Leontodon autumnalis* and *Plantago lanceolata* are all frequent to abundant.

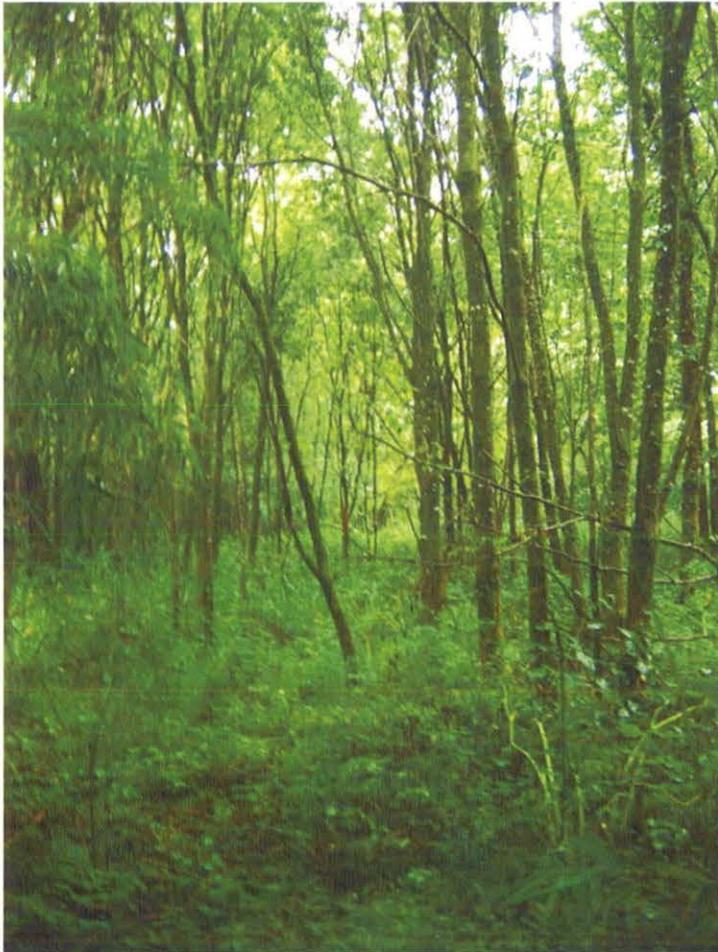


Plate 11 (IR 69475 79267) Wet woodland dominated by *Betula pubescens* and *Salix cinerea*. Common ground flora species include *Iris pseudacorus*, *Carex remota*, *Urtica dioica* and *Geranium robertium*.



Plate 12 (IR 70274 81028) Area of species rich marsh dominated by *Juncus effusus*, *Juncus acutiflorus* and *Filipendula ulmaria*. Other species present include locally dominant *Iris pseudacorus*, frequent *Cirsium palustre*, *Ranunculus flammula*, *Mentha aquatica* and *Potentilla anserina*. There is some *Ulex europaeus* encroachment in this area.



Plate 13 (IR 66446 85865) High quality wet grassland dominated by *Juncus acutiflorus*. In the wettest patches there is some *Hydrocotyle vulgaris* and *Potentilla palustre*.



Plate 14 (IR 66807 85689) Dense marsh dominated by *Filipendula ulmaria*, but with abundant *Lythrum salicaria*. There are scattered bushes of *Salix cinerea*.



Plate 15 (IR 66598 87035) Narrow strip of *Fraxinus excelsior* dominated woodland along a small river, with frequent *Acer pseudoplatanus* and *Corylus avellana*.



Plate 16 (IR 67846 85813) The low end of this field is marshy grassland dominated by *Juncus effusus*. *Juncus inflexus* is locally frequent. Frequent herbs include *Lythrum salicaria*, *Filipendula ulmaria*, *Lotus pedunculatus*, *Angelica sylvestris* and *Cirsium palustre*.



Plate 17 (IR 68820 85815) Wet grassland dominated by *Juncus effusus* but with abundant *Juncus acutiflorus*. There is occasional to frequent *Filipendula ulmaria* and locally abundant *Succisa pratensis*, and scattered *Lythrum salicaria*.



Plate 18 (IR 69566 85961) *Betula* sp. dominated woodland, with *Salix cinerea* abundant locally, especially near the lough. The trees are of variable age, some being quite old.



Plate 19 (IR 69826 86323) Large area of swamp dominated by *Juncus* sp and in places *Phragmites*. *Equisetum palustre* is abundant. Frequent herbs include *Filipendula ulmaria*, *Angelica sylvestris*, *Mentha aquatica* and *Iris pseudacorus*. *Lythrum salicaria* is occasional. There is a lot of *Alnus glutinosa* regeneration, and some scattered *Salix* sp.



Plate 20 (IR 69817 86545) A small ungrazed meadow and adjacent natural woodland. The meadow is dominated by *Agrostis* sp. with frequent *Festuca rubra* and *Anthoxanthum odoratum*. *Plantago lanceolata*, *Trifolium repens* and *Leontodon autumnalis* are all abundant; *Centaurea nigra* and *Trifolium pratense* are frequent. The adjacent woodland, which surrounds the meadow on all sides except the east, contains a dense mix of *Betula*, *Corylus avellana* and *Fraxinus excelsior* with occasional *Quercus* sp. and *Alnus glutinosa*.



Plate 21 (IR 70008 86875) Small roadside strip of natural woodland dominated by *Betula pubescens* and *Fraxinus excelsior*, with frequent *Salix cinerea*, *Crataegus monogyna* and *Ilex aquifolium*. There are several half-fallen trees. *Rubus fruticosus* and *Hedera helix* are most dominant beneath but there is also frequent *Brachypodium sylvaticum* and *Hyacinthoides non-scripta*. There are some marshy patches.



Plate 22 (IR 70480 86368) Area of woodland, within young *Fraxinus excelsior* plantation, dominated by *Betula pubescens*. *Molinia caerulea* and *Rubus fruticosus* are dominant beneath.



Plate 23 (IR 71917 86606) Area of wet woodland with *Quercus* sp and *Betula* sp. dominant but with additional species *Alnus glutinosa* and *Fraxinus excelsior* abundant. The ground flora is composed of *Geranium robertium*, *Glechoma hederacea*, *Carex remota* and fern spp. There is also frequent moss spp.



Plate 24 (IR 71964 86638) Clearing in middle of wet woodland. Species rich wet grassland with abundant *Holcus lanatus* and *Dactylis glomerata* and *Juncus effusus*. *Iris pseudacorus* is locally dominant and there is abundant *Filipendula ulmaria* and *Lotus pedunculatus*, frequent *Epilobium palustre* and *Lythrum salicaria*.



Plate 25 (IR 75973 89847) Extensive area of species rich wet grassland with abundant *Juncus* spp, *Potentilla anserina*, *Centaurea nigra* and *Filipendula ulmaria*. Also with abundant *Arrhenathrum elatius*, *Holcus lanatus* and *Anthoxanthum odoratum*. This area was very wet at the time of survey, further investigation is recommended as access was difficult.



Plate 26 (IR 75679 90274) Area of heath. Couldn't get access to this habitat due to the surrounding land being flooded which made it too dangerous to access. Given the mosaic of different habitats within this area of heath, which included young *Salix* sp scrub, *Pteridium aquifolium* it is possible that this area is cutover bog. However, due to the area not being accessed it is not possible to determine for certain which type of heath habitat this is.



Plate 27 (IR 75117 88288) It is recommended that this area of semi-improved should undergo a full survey and possible protection. There is abundant *Filipendula ulmaria*, frequent *Lythrum salicaria*, locally abundant *Typha*, abundant *Anthoxanthum odoratum*, abundant to locally dominant *Holcus lanatus*, occasional *Cirsium palustre*, occasional *Angelica sylvestris* and *Centaurea nigra*. There is also orchid potential within this area of grassland.



Plate 28 (IR 74830 86951) Small meadow, borderline wet grassland, with high floristic value interest including orchid sp. Grid reference IR 7483 8696. Grass species include abundant *Agrostis* species, frequent *Anthoxanthum odoratum* and occasional *Brizia media*. There is frequent *Juncus articulatus*, *Trifolium pratense*, *Centaurea nigra*, *Carex flacca* and *Succisa pratensis*. There is occasional *Filipendula ulmaria*, *Eupatorium cannabinum*, *Lythrum salicaria*, *Pulicaria dysenterica*, *Prunella vulgaris*, *Potentilla anserina*, *Potentilla erecta*, *Molinia caerulea*, *Juncus effusus* and *Hypericum tetrapterum*.



Plate 29 (IR 74066 87745) Unimproved area of wet grassland with abundant *Holcus lanatus*, *Filipendula ulmaria*, *Juncus effusus* and *Ranunculus repens*. There is frequent *Lythrum salicaria*, *Calystegia sepium*, *Agrostis stolonifera* and occasional *Ranunculus acris* and *Stachys palustris*.

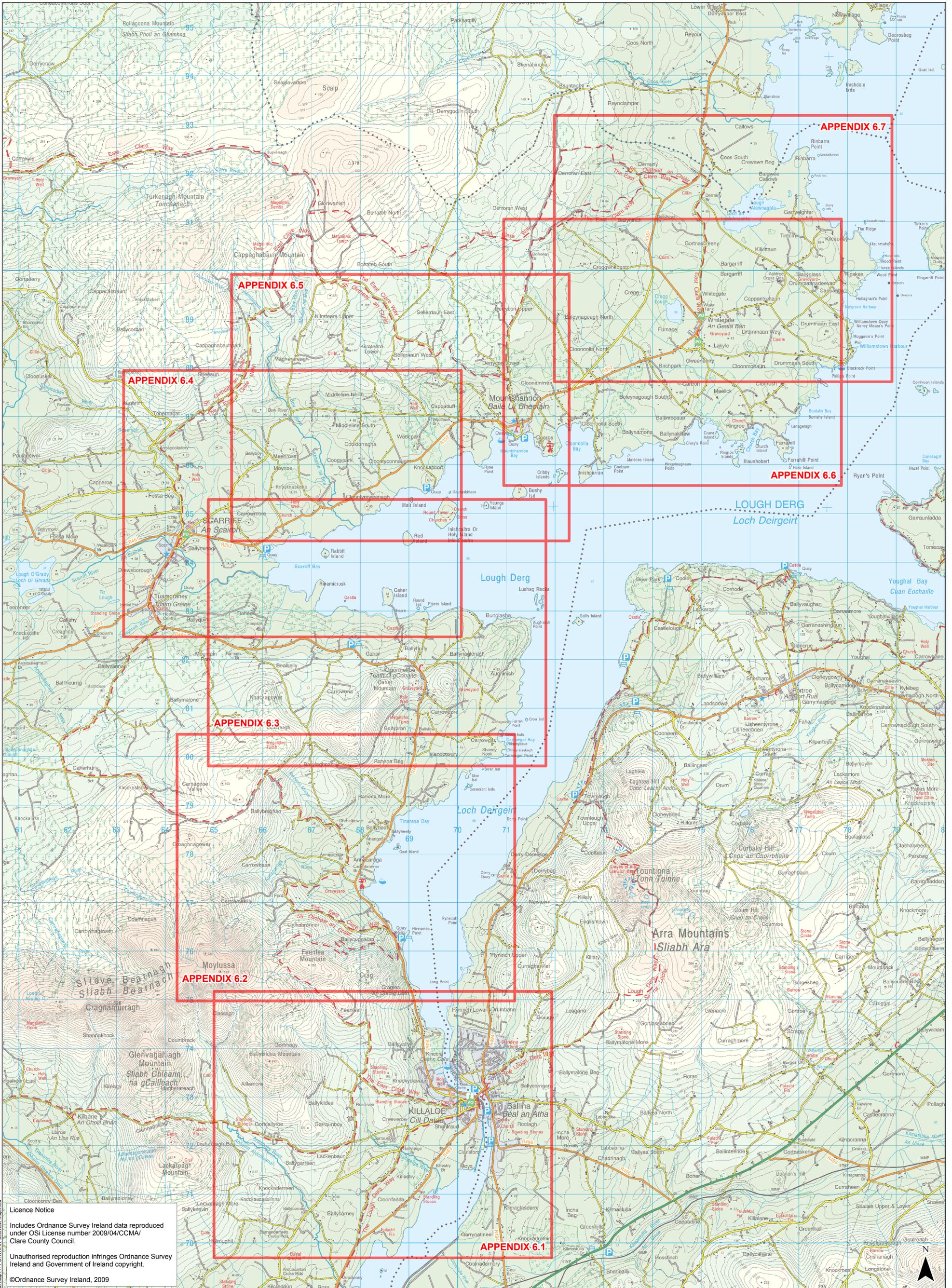


Plate 30 (IR 76800 87265) There is abundant *Iris pseudacorus* and *Filipendula ulmaria* with frequent *Lythrum salicaria*, *Juncus inflexus* and *Juncus effusus*, *Pulicaria dysenterica*, *Rubus fruticosus*, *Cirsium palustre* and *Salix cinerea*. There is also occasional *Epilobium parviflorum*.



APPENDIX 5

Overview of Survey Area



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Legend

 Detailed Survey Areas
 (See Corresponding Appendix Figure)

Drawing Title

**CLARE COUNTY COUNCIL
 HABITAT SURVEY**

SURVEY OVERVIEW MAP

Drawing Number

APPENDIX 5

Scale at A1 : 1:35,000

Drw BB	App JS	Rev
Chk TD	Date 09.04.09	Date



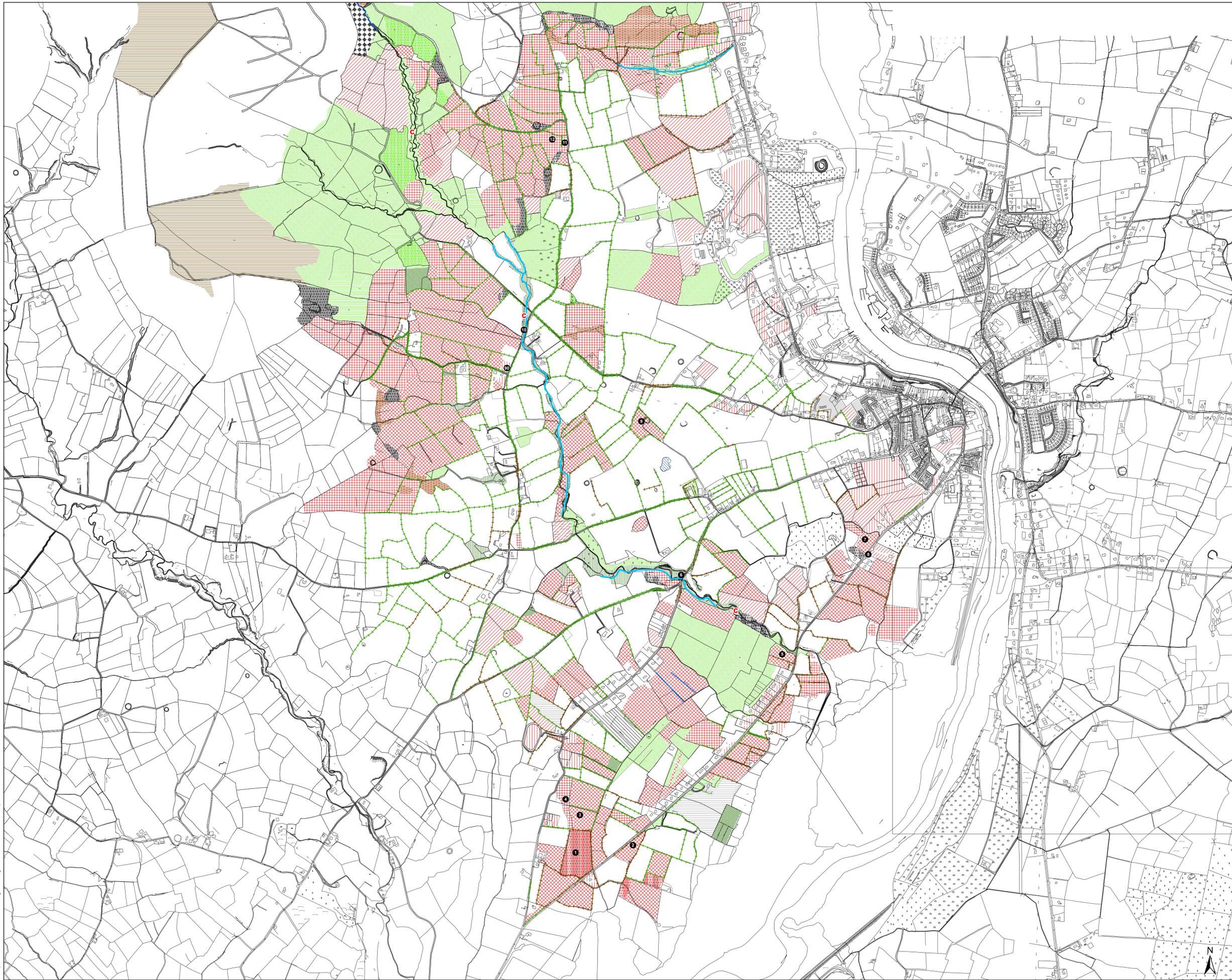
www.scottwilson.com

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APPENDIX 6

Fossitt Level 3 Habitat Survey Maps



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

NOTES

- Target Note
- Ecological Corridor
- Species Rich Habitats
- BL1 - Stone Walls and Other Stonework
- FW1 - Eroding / Upland River
- FW4 - Drainage Ditch
- WL1 - Hedgerow
- WL2 - Treeline
- BC1 - Arable Crops
- BC3 - Tilled Land
- BC2 - Horticultural Land
- BL2 - Earth Banks
- BL3 - Buildings and Artificial Surfaces
- BC4 - Flower Beds and Borders
- ED3 - Recolonising bare ground
- ED4 - Active Quarries and Mines
- ER1 - Exposed Siliceous Rock
- FL5 - Eutropic Lakes
- FS1 - Reed and Large Sedge Swamp
- FS2 - Tall Herb Swamps
- GA1 - Improved Agricultural Grassland
- GA2 - Amenity Grassland (Improved)
- GM1 - Marsh
- GS1 - Dry Calcareous and Neutral Grassland
- GS2 - Dry Meadows and Grass Verges
- GS3 - Dry-Humid Acid Grassland
- GS4 - Wet Grassland
- HD1 - Dense Bracken
- HH1 - Dry siliceous heath
- WD1 - Broadleaved Woodland (Mixed)
- WD2 - Mixed Broadleaved/Conifer Woodland
- WD4 - Conifer Plantation
- WN2 - Oak-Ash-Hazel Woodland
- WN4 - Wet Pedunculate Oak - Alder - Ash woodland
- WN6 - Wet Willow-Alder-Ash Woodland
- WN7 - Bog Woodland
- WS1 - Scrub
- WS2 - Immature Woodland
- WSS - Recently Felled Woodland

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Revision Details	By	Date	Suffix
	Check		

Drawing Status: **FINAL**

Job Title:
**CLARE COUNTY COUNCIL
 HABITAT SURVEY**

Drawing Title:
**FOSSITT LEVEL 3
 HABITAT SURVEY**

Scale at A1: **1:10,000**

Drawn: **BB** Approved: **TD**

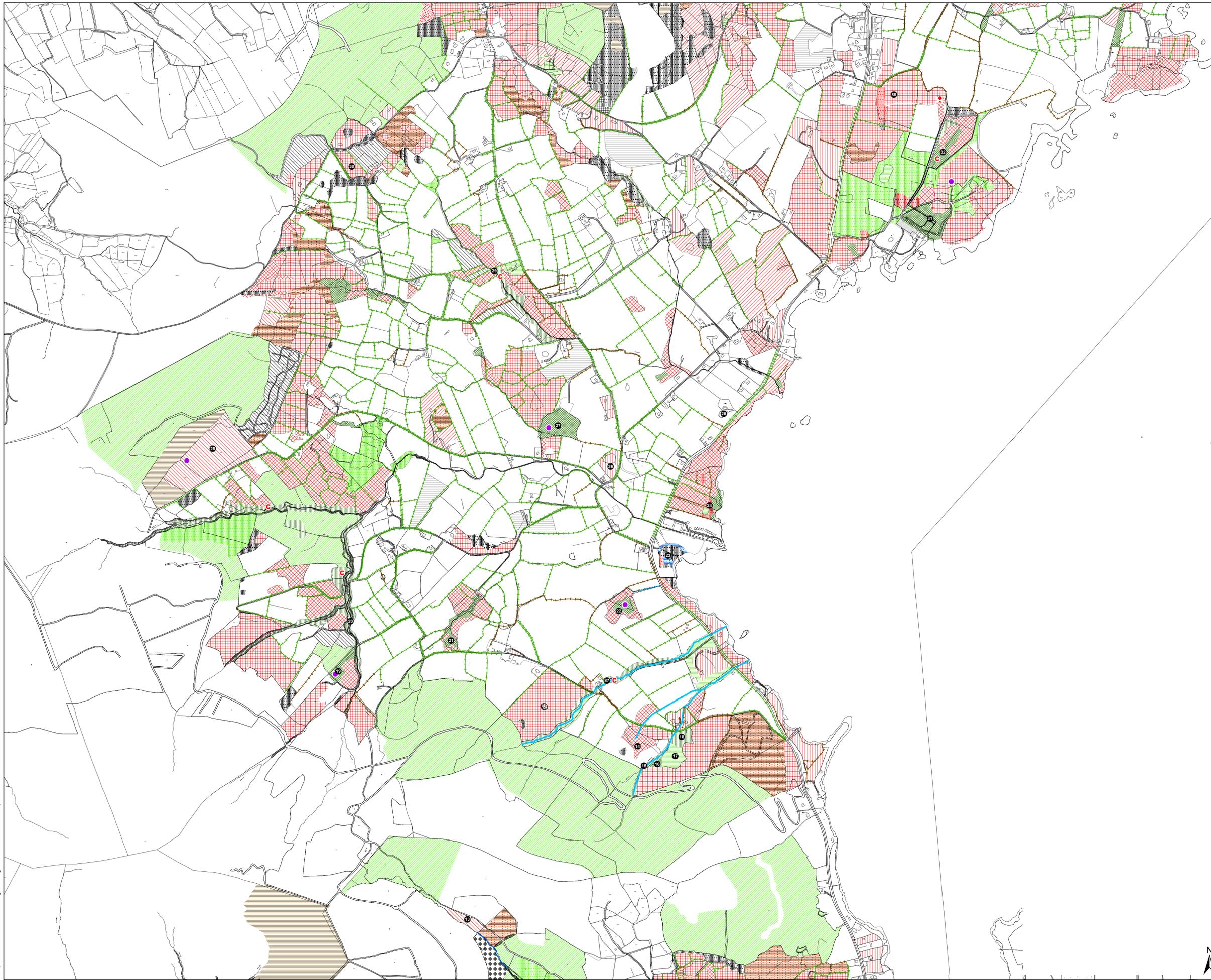
Stage 1 check	Stage 2 check	Originated	Date

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Drawing Number: **APPENDIX 6.1** Rev





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NOTES

- Target Note
- Ecological Corridor
- Species Rich Habitats
- BL1 - Stone Walls and Other Stonework
- FW1 - Eroding / Upland River
- FW4 - Drainage Ditch
- WL1 - Hedgerow
- WL2 - Treeline
- BC1 - Arable Crops
- BC3 - Tilled Land
- BC2 - Horticultural Land
- BL2 - Earth Banks
- BL3 - Buildings and Artificial Surfaces
- BC4 - Flower Beds and Borders
- ED3 - Recolonising bare ground
- ED4 - Active Quarries and Mines
- ER1 - Exposed Siliceous Rock
- FL5 - Eutropic Lakes
- FS1 - Reed and Large Sedge Swamp
- FS2 - Tall Herb Swamps
- GA1 - Improved Agricultural Grassland
- GA2 - Amenity Grassland (Improved)
- GM1 - Marsh
- GS1 - Dry Calcareous and Neutral Grassland
- GS2 - Dry Meadows and Grass Verges
- GS3 - Dry-Humid Acid Grassland
- GS4 - Wet Grassland
- HD1 - Dense Bracken
- HH1 - Dry siliceous heath
- WD1 - Broadleaved Woodland (Mixed)
- WD2 - Mixed Broadleaved/Conifer Woodland
- WD4 - Conifer Plantation
- WN2 - Oak-Ash-Hazel Woodland
- WN4 - Wet Pedunculate Oak - Alder - Ash woodland
- WN6 - Wet Willow-Alder-Ash Woodland
- WN7 - Bog Woodland
- WS1 - Scrub
- WS2 - Immature Woodland
- WSS5 - Recently Felled Woodland

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Revision Details	By	Date	Suffix

Drawing Status: **FINAL**

Job Title:
CLARE COUNTY COUNCIL HABITAT SURVEY

Drawing Title:
FOSSITT LEVEL 3 HABITAT SURVEY

Scale at A1: **1:10,000**

Drawn: **BB** Approved: **TD**

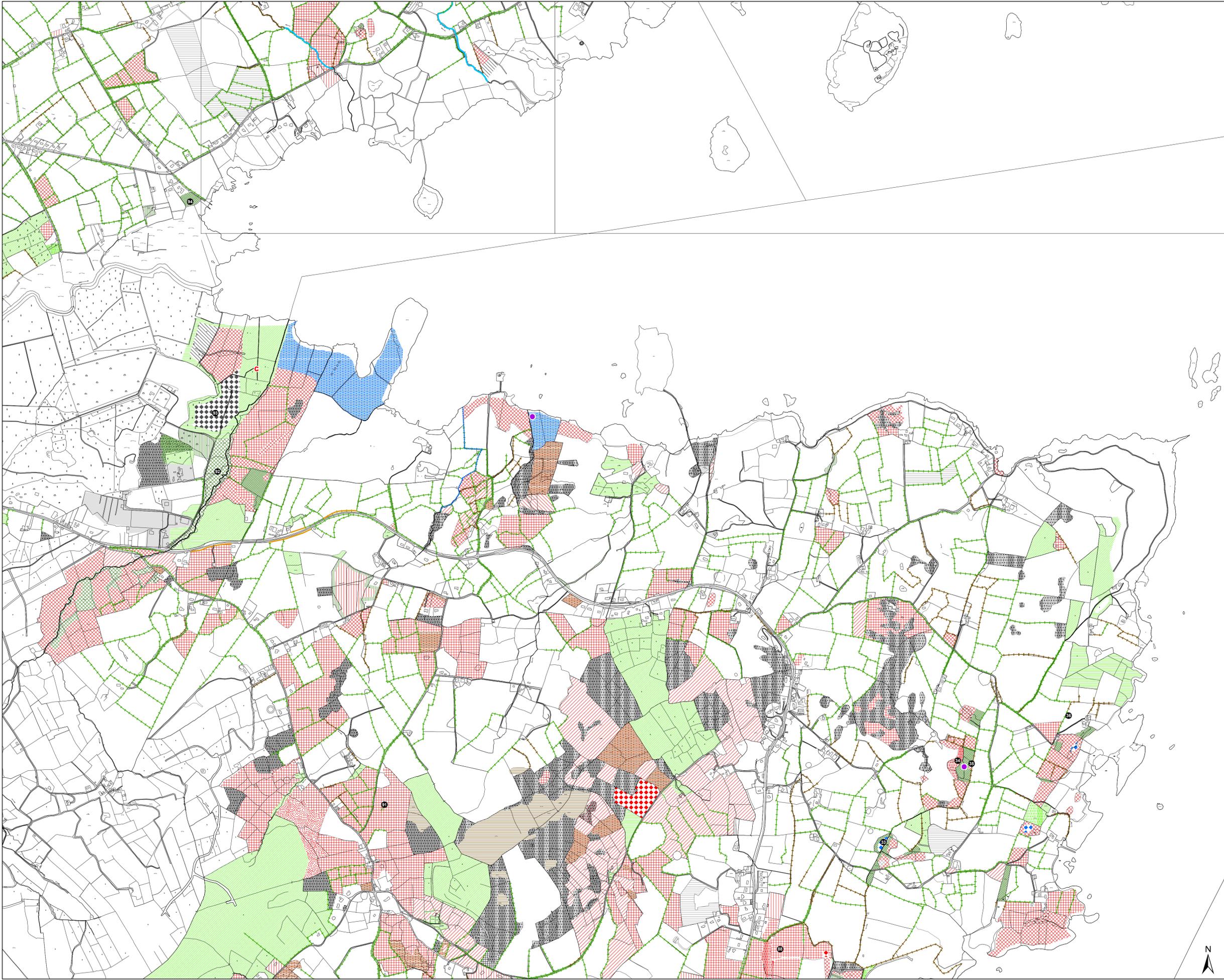
Stage 1 check	Stage 2 check	Originated	Date

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Drawing Number: **APPENDIX 6.2** Rev





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NOTES

- Target Note
- Ecological Corridor
- Species Rich Habitats
- BL1 - Stone Walls and Other Stonework
- FW1 - Eroding / Upland River
- FW4 - Drainage Ditch
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- WL2 - Treeline
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- WS1 - Scrub
- WS2 - Immature Woodland
- WSS - Recently Felled Woodland

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Job Title:
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Drawing Title:
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Scale at A1: **1:10,000**

Drawn: **BB** Approved: **TD**

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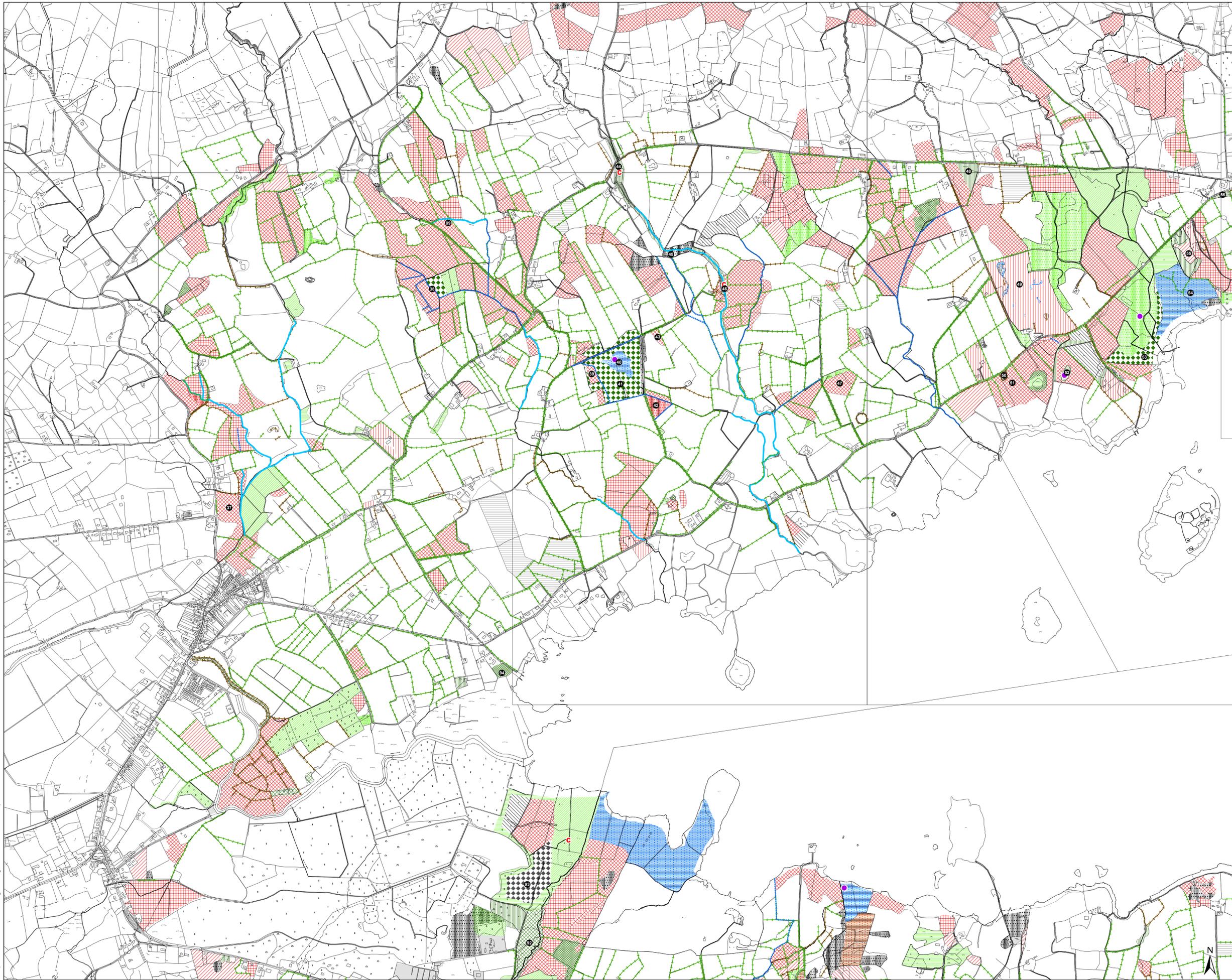
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Date: 28th April 2009
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NOTES

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- Ecological Corridor
- Species Rich Habitats
- BL1 - Stone Walls and Other Stonework
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Drawing Title:
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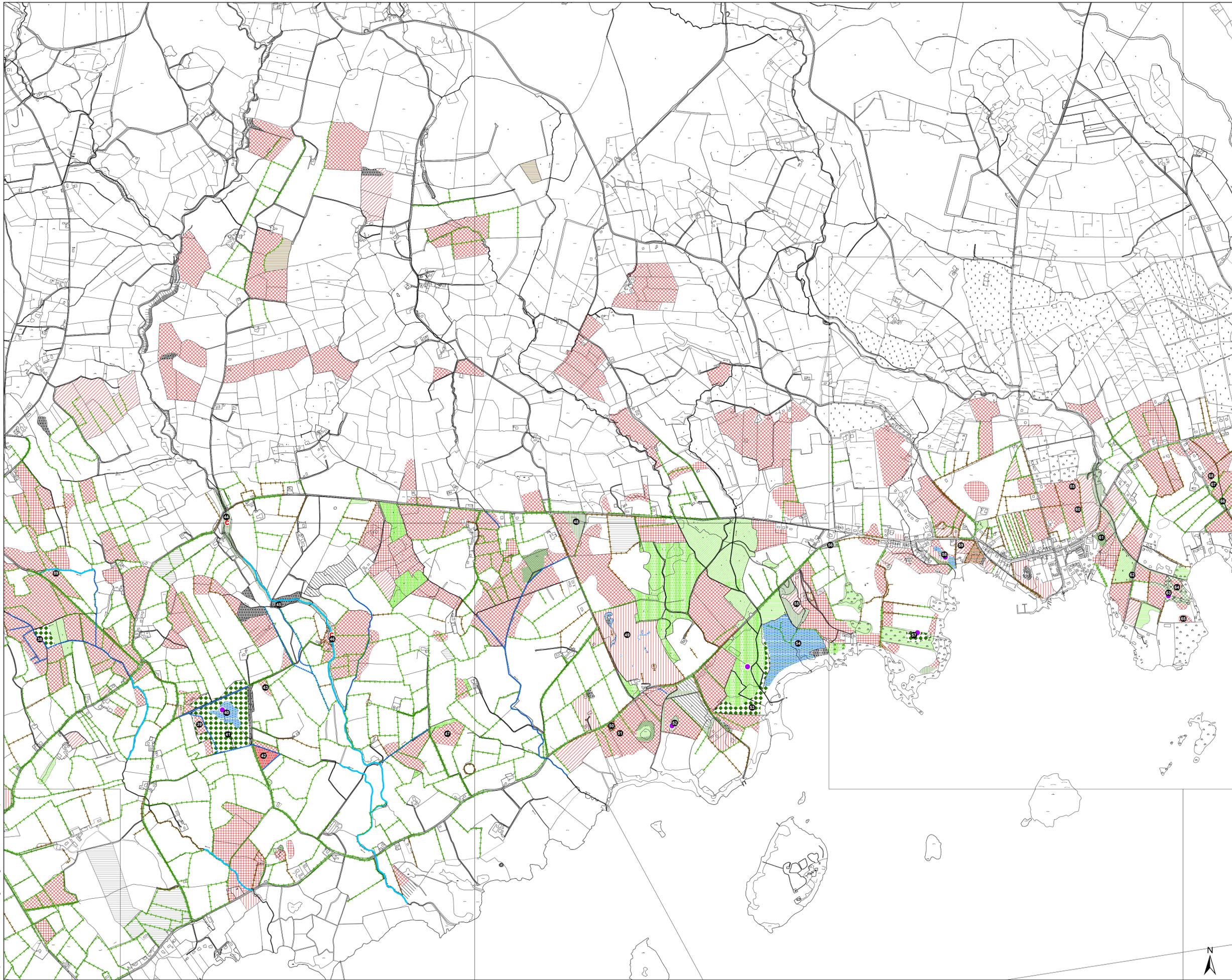
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Drawing Number: **APPENDIX 6.4** Rev



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NOTES

- Target Note
- Ecological Corridor
- Species Rich Habitats
- BL1 - Stone Walls and Other Stonework
- FW1 - Eroding / Upland River
- FW4 - Drainage Ditch
- WL1 - Hedgerow
- WL2 - Treeline
- BC1 - Arable Crops
- BC3 - Tilled Land
- BC2 - Horticultural Land
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- BL3 - Buildings and Artificial Surfaces
- BC4 - Flower Beds and Borders
- ED3 - Recolonising bare ground
- ED4 - Active Quarries and Mines
- ER1 - Exposed Siliceous Rock
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Job Title: **CLARE COUNTY COUNCIL HABITAT SURVEY**

Drawing Title: **FOSSITT LEVEL 3 HABITAT SURVEY**

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Drawn: **BB** Approved: **TD**

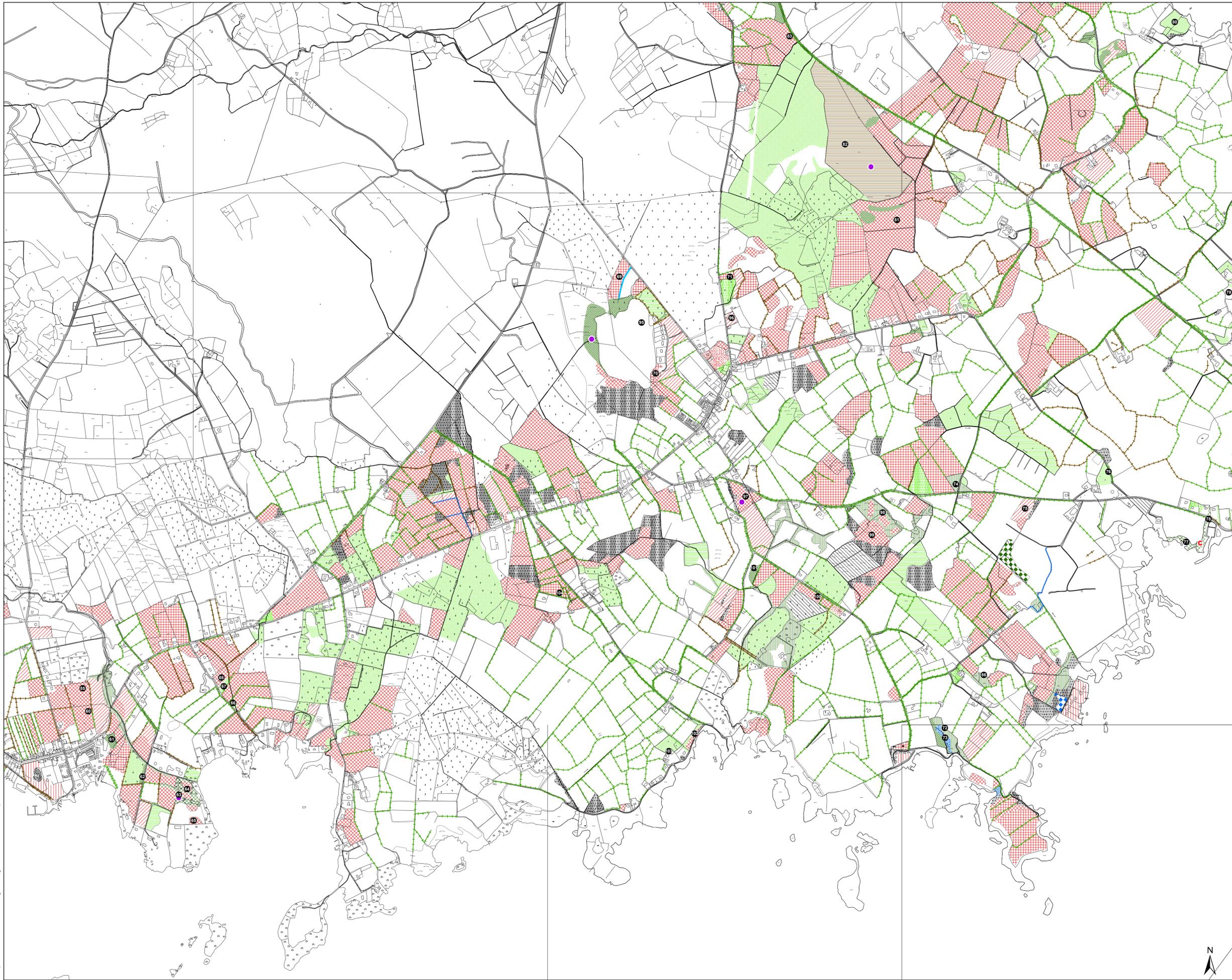
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NOTES

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- Ecological Corridor
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Job Title: **CLARE COUNTY COUNCIL HABITAT SURVEY**

Drawing Title: **FOSSITT LEVEL 3 HABITAT SURVEY**

Scale at A1: **1:10,000**

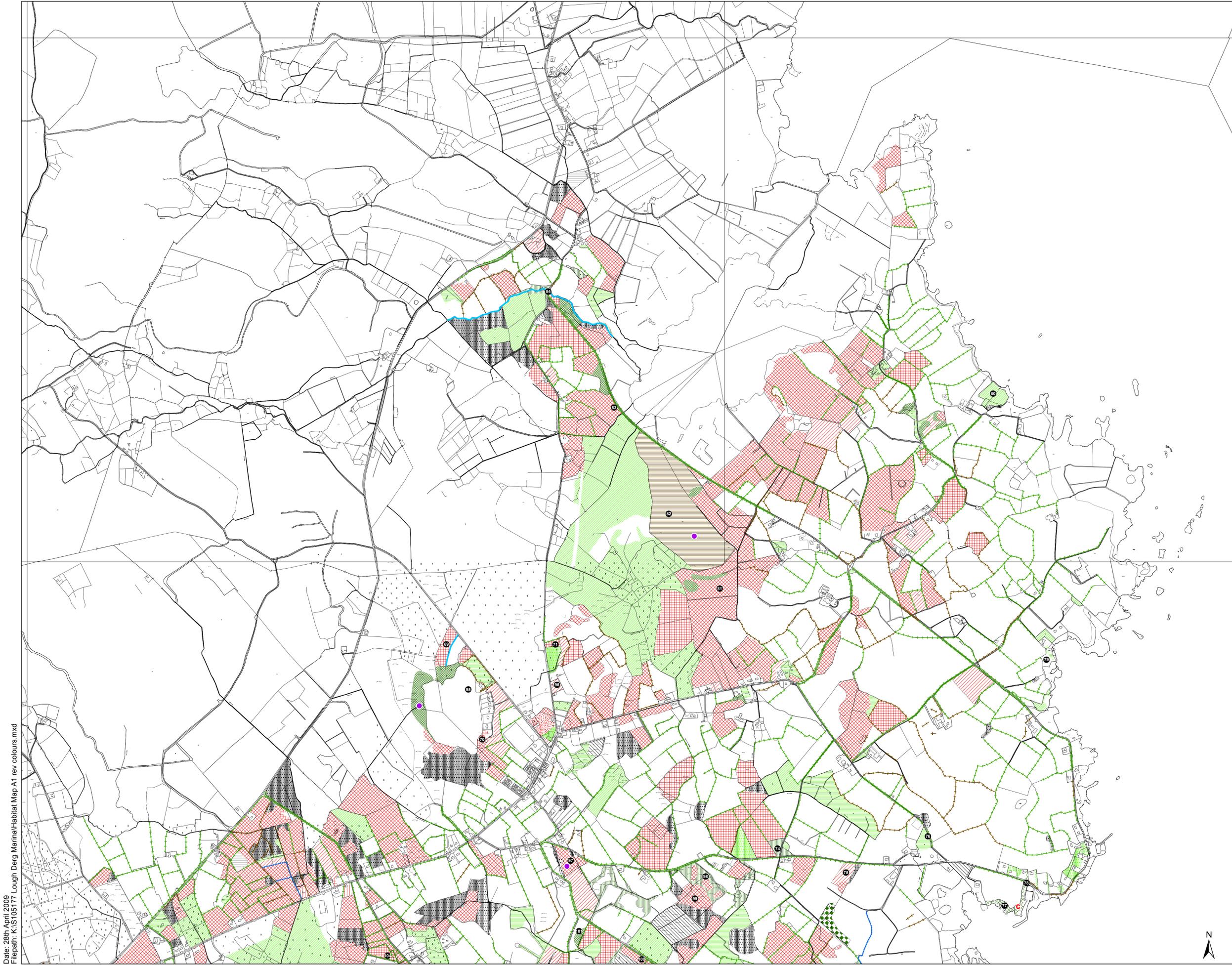
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Drawing Number: **APPENDIX 6.6** Rev





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- NOTES**
- Target Note
 - Ecological Corridor
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 - BL1 - Stone Walls and Other Stonework
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Job Title:
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Drawing Title:
FOSSITT LEVEL 3 HABITAT SURVEY

Scale at A1: **1:10,000**

Drawn: **BB** Approved: **TD**

Stage 1 check	Stage 2 check	Originated	Date

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Drawing Number: **APPENDIX 6.7** Rev

Date: 28th April 2009
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